

MIND

A QUARTERLY REVIEW

OF

PSYCHOLOGY AND PHILOSOPHY

I.—MR. COLLINGWOOD AND THE ONTOLOGICAL ARGUMENT.

BY GILBERT RYLE.

MR. COLLINGWOOD, in his interesting "Essay on Philosophical Method", is embarking on a set of enquiries which are of obvious importance. His aim is to find out what philosophy is and what is the right way of proceeding in that activity. And his enterprise has a special momentary interest, for of recent years the discussions of these questions have been the monopoly of one or two schools of thought which are poles asunder from the point of view which Mr. Collingwood represents. For Mr. Collingwood is presumably to be classified, for what such labels are worth, as an Idealist, and it is high time that the questions which have been in the forefront of the debates of such thinkers as Russell, Moore, Broad, Wittgenstein, Carnap, Schlick, Stebbing, and again as the members of the school or schools of Husserl and Meinong, should be at least considered again in the quarters which protest (perhaps a little too much) allegiance to Plato, Kant, in his less Humean moods, and Hegel.

Now I think that Mr. Collingwood's general views are wrong; but I want only to discuss, and if possible to refute, certain theories which he expounds in his chapter vi. which is entitled "Philosophy as Categorical Thinking". And I confess at once that I intend to be destructive only. That is, I do not propose to say that philosophical propositions are all or mostly of this or that logical form, but only to show the mistakes which I believe Mr.

Collingwood makes when he tries to show that philosophical propositions are (in a certain sense of the term) categorical. The question is of cardinal importance; for he holds that philosophical propositions are in a peculiarly close way connected with what exists; in a way, indeed, in which the empirical sciences are remoter from what exists than philosophy is. And a part of his theory is that philosophy can by the Ontological Argument establish the existence of a very important somewhat, and that philosophy in general aims at discovering—and no other sort of enquiry can discover—the nature of the somewhat. So that, if Mr. Collingwood is right, constructive metaphysics is the proper business of philosophy, and Hume and Kant were wrong in so far as they maintained that *a priori* arguments cannot establish particular matters of fact.

The chapter begins by elucidating the sense in which Mr. Collingwood and logicians generally declare that the propositions of geometry and arithmetic are 'hypothetical,' namely that though, in a sense, propositions may be 'about' triangles or circles, yet there do not have to exist any triangles or circles for the propositions to be true. They only say, 'if something had such and such properties, it would have such and such other properties'; and it is not said or implied that anything does so. At least, this is how I paraphrase Mr. Collingwood's own statement. He himself says 'In order to assert a proposition in mathematics it is not necessary to believe that the subject of discourse has any actual existence. We say that every square has its diagonals equal; but to say this we need not think that we have any acquaintance with actual squares. . . . What is necessary is not to believe that a square anywhere or in any sense exists, but to suppose it. . . . In mathematics, we frame a supposition and then see what follows from it; . . .' And this seems unexceptionable.

He then argues that not indeed the whole but the body of empirical science consists of propositions which are hypothetical in the same sense. I think he slightly obscures his position here by failing to distinguish the *generality* of the propositions which profess to state 'laws' from the innocent fictitiousness of certain sorts of scientific propositions which pretend to be about the 'standard cases' of roses, *e.g.*, or tuberculosis. But I don't think it matters to the argument. (The way in which 'dogs are carnivorous' applies to Fido but does not depend for its truth on Fido's existing is different from the way in which 'the typical schoolboy likes cricket' applies to Tommy, but neither states nor implies that he exists.) Mr. Collingwood sees, of course, that

empirical sciences must have propositions stating particular matters of fact among their premisses, and that they may (as in the Nautical Almanac, I suppose) embody others in the application of laws to the world. And these will be categorical. But he asserts (I am not clear why) that the body of scientific knowledge 'consists' of hypothetical propositions, and its categorical propositions are only 'necessary or fortuitous accompaniments of it.' But we need not quarrel over this, for it is clear that there are universal propositions in the findings of the empirical sciences and that these do differ in logical form from propositions asserting such particular matters of fact as that the patient's temperature has been this or that at such and such a time. Now Mr. Collingwood wants to show that none or few of the propositions of philosophy are hypothetical in the sense in which the propositions of mathematics and the universal propositions of empirical science are hypothetical; but on the contrary that all or most philosophical propositions are categorical in the same sense (or anyhow an analogous sense) as the proposition about the patient's temperature was categorical.

But before we come to this I must, I fear, clarify one or two points in what I take to be Mr. Collingwood's use of the term 'hypothetical'. First of all there are plenty of 'if-then' propositions which do imply the existence of their subjects. 'If Hitler lives for another year, he will be at loggerheads with Mussolini' cannot be true or false unless there exists a Hitler and a Mussolini. Mr. Collingwood is obviously referring to the universality of general propositions rather than to their 'if-then-ness'; he is affirming, that is, that philosophical propositions differ from the propositions of mathematics and the general propositions of empirical science in the fact that philosophical propositions directly refer to something which exists in a way in which the others fail to do this. He is not making what would be the quite different point that philosophers never or seldom say that from something's being the case something else would follow.

At least I think that this is all that his argument about mathematical propositions and the universal propositions of the empirical sciences can be intended to establish. Yet in Section 4, where he appeals to the authority of Plato, Aristotle, Kant and Hegel, he does seem to confuse the two points. For in one breath he quotes Aristotle's definition of the subject-matter of metaphysics as reality or being, Hegel's declaration that 'the subject-matter of philosophy is no mere thought and no mere abstraction but *die Sache selbst*,' as well as Plato's assertion that dialectic demands for itself a non-hypothetical starting-point, and Kant's dictum

that 'in a critique of pure reason anything in the nature of a hypothesis must be treated as contraband.' But the Aristotle-Hegel point is quite different from the Plato-Kant point. Plato and Kant are saying that philosophy must not lay down propositions which depend for their truth upon premisses not known to be true. Philosophy does not consist in deducing consequences from assumptions. And this, though true and important, is not the same thing as to say that philosophical propositions state or entail particular matters of fact, *i.e.*, that they are 'about' a designated entity. Some philosophers have, indeed, held that there are some general propositions which are known to be true *à priori*, and that philosophy starts from these. This theory (I don't think it is true) would secure what Plato and Kant are here demanding for philosophy without providing what Aristotle and Hegel require.

Let me try to restate the distinction between the two senses of 'hypothetical proposition' which seem to be confused in Mr. Collingwood's treatment.

1. Primarily Mr. Collingwood means by 'hypothetical proposition' a general, indeed an universal proposition of the form 'anything that is A is B' or 'if anything is A, it is B' or 'all A's are B.' Such propositions do not depend for their truth on this or that thing being an A and thus do not 'imply the existence of their subject-terms'.

2. But sometimes he means by 'hypothetical proposition' a proposition which states that a certain consequent would follow if a certain protasis were true, when it is not known or said or implied that the protasis is true. The truth of the whole 'if-then' is independent of the truth or falsity of the protasis taken as an independent proposition. That is how we can make deductions from a mere assumption.

But (a) in *this* sense an hypothetical proposition may well depend for its truth on the existence of its subject-term: for it may, as we saw, be about Hitler or Julius Cæsar, and so depend for its being true or false on there existing a Hitler or a Julius Cæsar, though not, of course, on the protasis about Hitler, say, being true when taken as an independent proposition. The protasis of an hypothetical proposition may express the assumption that something not known to exist does exist; but it may equally well express the assumption that something known to exist has a character which it is not known to possess or is known not to possess, or the assumption that something known to exist does not exist. Not all assumptions are assumptions of the existence of a so and so.

And (b) the protasis of a *general* hypothetical proposition does not express the assumption that something of a certain description exists. 'Anyone found trespassing will be prosecuted' is a general hypothetical. But the protasis cannot be taken by itself. It is nonsense to say 'anyone is found trespassing'. There is no such animal as 'anyone'.

Now, as Mr. Collingwood is concerned with such facts as that geometry is independent of the *existence* of squares, it is clear that his argument turns not on the general point that consequences can be deduced from protases which are assumed (*i.e.*, not known to be true when taken as independent propositions), but on the special point that universal propositions do not depend for their truth on the existence of instances of the characters between which connection is asserted. For he is trying to prove not that philosophy requires self-evident premisses, but that it is about something which can be known to exist, for which purpose he has to show that its propositions are not *general* hypotheticals.

In Section 5 Mr. Collingwood unfolds his main reason for thinking that philosophical propositions, or most of them, or the best of them, are not hypothetical but categorical. This we now see means that they refer to something which exists, or contain or rest on propositions which do so. And this must mean, to use language which is not Mr. Collingwood's, that philosophical propositions are or contain or rest on propositions embodying either at least one logically proper name or else at least one definite description which does in fact describe something. In short, every philosophical proposition is or contains or rests on a genuine singular proposition. (Though on p. 136 Mr. Collingwood distinguishes between the categorical singular judgements of history and the categorical universal [judgments] of philosophy. I cannot make head or tail of this. After the labours Mr. Collingwood has taken to distinguish between (general) hypothetical propositions and categorical, it is upsetting to find that apparently after all some judgements may be universal and so (I suppose) expressible in purely general terms and yet categorical in the sense of referring to something actually existing. I fear that the principle of the overlap of Classes will be brought in to give us *carte blanche* to have it both ways when it suits our convenience!)

And his first argument for this conclusion is that the Ontological Argument is valid, and is presupposed by all other philosophical arguments, or the best of them. He paraphrases the goal of Anselm's argument by saying that 'thought when it follows its own bent most completely and sets itself the task of thinking

out the idea of an object that shall completely satisfy the demands of reason may appear to be constructing a mere *ens rationis*, but in fact is never devoid of objective or ontological reference'. (A caviller might want to know why the idea of an object *should* satisfy the demands of reason, or, more importantly, how reason can be dissatisfied with the idea of any object. And why should we suppose that it is in philosophy that thought is following its own bent most completely rather than in, say, astronomy or Antarctic exploration, in which we certainly discover things existing which we did not know of before ?)

Mr. Collingwood says 'Anselm's argument that in conceiving a perfect being we are conceiving a subject possessed of all positive predicates, including that of existence, so that to think of this is already to think of it as existing, is an argument open to objection on the logical ground that existence is not a predicate; but the substance of his thought survives all such objections. . . .' But unfortunately this is precisely where I should have thought not only Hume and Kant but almost all recent logicians who have attended to the analysis of existential propositions would dig their heels in and say that the argument is an obvious fallacy *unless* existence is a 'predicate'; and that existence is not a 'predicate'. We can see how implications obtain between 'predicates,' *i.e.*, how *if* something is an A, it is B-ish. But how can the *existence* of an A or a B be implied? How can 'something is an A' follow from the proposition 'anything that is an A, is B-ish'? How can a particular matter of fact be deduced from *à priori* or non-empirical premisses?

Mr. Collingwood rather cavalierly dismisses Kant's refutation of the Ontological Argument as merely a result of 'that false subjectivism and consequent scepticism from which, in spite of heroic efforts, he never wholly freed himself. With Hegel's rejection of subjective idealism, the Ontological Proof took its place once more among the accepted principles of modern philosophy, and it has never again been seriously criticised.' To my mind this dictum almost merits tears. One of the biggest advances in logic that has been made since Aristotle, namely Hume's and Kant's discovery that particular matters of fact cannot be the implicates of general propositions, and so cannot be demonstrated from *à priori* premisses, is written off as a backsliding into an epistemological or psychological mistake, and all's to do again.

And we must swallow with regret the dismissal of the whole of the work in logic which can be loosely described as Russellian. Its criticisms, *e.g.*, of the Ontological Argument must not be ac-

counted serious criticism—because, I suppose, it has rejected that very subject-predicate logic which made it verbally plausible to argue from ‘essence’ to ‘existence’. (Or perhaps because it happens to use Greek letters for some of its symbols instead of the canonised S, M and P.)

But to continue. Mr. Collingwood after showing that the Ontological Proof does not establish any particular *theological* truth, says ‘What it does prove is that essence involves existence, not always, but in one special case, the case of God in the metaphysical sense: the *Deus sive natura* of Spinoza, the Good of Plato, the Being of Aristotle: the object of metaphysical thought. But this means the object of philosophical thought in general; for metaphysics, even if it is regarded as only one among the philosophical sciences, is not unique in its objective reference or in its logical structure; all philosophical thought is of the same kind, and every philosophical science partakes of the nature of metaphysics, which is not a separate philosophical science but a special study of the existential aspect of that same subject-matter whose aspect as truth is studied by logic and its aspect as goodness by ethics.’ (But what is an ‘existential aspect’? Is, after all, the existence of a thing just one among its other attributes or ‘predicates’?)

‘Reflection on the history of the Ontological Proof thus offers us a view of philosophy as a form of thought in which essence and existence, however clearly distinguished, are conceived as inseparable. On this view, unlike mathematics or empirical science, philosophy stands committed to maintaining that its subject-matter is no mere hypothesis, but something actually existing.’

But what is the cash-value of this slogan ‘Essence involves existence’? First of all, ‘essence’ is used only in relation; we speak of ‘the essence of . . .’ or so and so is ‘essential to . . .’ What sort of correlate is appropriate? We cannot speak (correctly) of the essence of this pipe or of Socrates, we can only speak (correctly) of the essence of some general character or description or ‘predicate’. That is, we can say that it is part of the essence of Man, or of being a man, to be capable of inference. If x can’t infer then x is not a man.

There are cases, then, where we can correctly enough say that the essence of so and so involves so and so, namely where we can say that being of such and such a sort involves having such and such a property: or that if something has a certain character, it follows that it has such and such another.

Now there are some characters which are such that if anything

has one of them, no other thing can have it ; I think these are always complex ; but for the present purpose that does not matter. ' Being the President of the United States on August 19, 1934 ' is a character which, I think, belongs to one man and could not belong to two or more. ' Being the oldest man now alive in Oxford ' is another. We can call these, if we like, idiosyncratic or peculiar characters, or, if we prefer, call the phrases which symbolise them ' definite ' or ' unique descriptions '. (The word ' the ' is the customary English symbol for such non-shareable characters.) And in the case of these characters too we can say, though with a slight awkwardness, that being so and so is of the essence of having this or that idiosyncratic or peculiar character. It might, for example, be of the essence of being the senior member of a certain committee to be its chairman. But of course a definite description may not in fact apply to anyone, or a peculiar character need not characterise anyone. Oxford may have an exclusively feminine population and the United States may have no President. So even in this special class of cases ' being x or being-the- x is essential to being-the- y ' may be true, although nothing is the x or the y .

Now the Ontological Argument says that there is one case where a peculiar character C has as a part of its essence not, as elsewhere, a certain property P , but the fact-that-something-has- C .

It is part of the *analysis* of ' perfectness ' that something is perfect. Part of the meaning of this one definite description is that the description fits something. Which is surely a glaring fallacy. Let us attempt to make it glare even more vividly.

It is maintained that in one case ' Essence involves existence '. What is this notion of ' involving ' ?

(1) Sometimes, perhaps, ' involves ' means what is nowadays often meant by ' entails ', namely the implication which holds between the having a certain specific character and the having the generic character of which the former is a species. Thus being green entails or ' involves ' being coloured, and being square entails or ' involves ' being shaped. But this is *not* the sense of ' involves ' in which the Ontological Argument says that ' Essence involves existence '. For its champions would then have had to allow that the same argument would prove the existence of other things than God. But anyhow, as a question of history I doubt if any of them committed the absurdity of pretending that ' existence ' is the name of a generic attribute.

(2) Sometimes ' involves ' is used to express whatever it is that natural laws formulate ; for example that a metal's being

heated involves its expanding. But this sort of 'involving' (if, *pace* Hume, there is such a thing) is established only by induction. There is no contradiction in the negating of a natural law; whereas the Ontological Argument says that there is a contradiction in denying the existence of God or perfection.

(3) No; though I do not claim to have exhausted the various possible meanings of the word, the sense of 'involves' required for the Ontological Argument is 'includes' or 'contains as a part or constituent'. When I say that the essence of bicycles involves their having two wheels in tandem, I simply mean that the complex character of being a bicycle consists of the simpler characters *a*, *b*, and *c*, and one of these simpler characters is that of having two wheels in tandem. So it is an analytic proposition to say that a bicycle has two wheels in tandem (unless it is a synthetic proposition about the English word 'bicycle', as is the case with dictionary definitions). And as this is precisely what was claimed by the Ontological Argument, namely that it is a contradiction to deny (*i.e.*, an analytic proposition to affirm) that God exists, it is clear that 'involves' in 'Essence involves existence' means precisely 'contains as a part or constituent'.

But the parts of a complex of characters are characters. So unless existence is a character or 'predicate', it cannot be 'involved' (in this sense) in the essence of a complex character. Certainly, 'exists' is the grammatical predicate of heaps of English sentences; but it is precisely here that the fallacy of the Ontological Argument arises. For it assumes (what is false) that in every sentence which is of the noun-verb pattern or the noun-copula-adjective pattern, the noun is a genuine proper name and the verb or adjective ascribes a quality to the thing named by the grammatical subject. But even if Hume and Kant were too subjectivist for their treatment of existential propositions to be treated seriously, surely Russell's theory of descriptions and his consequential analysis of existential propositions as a species of general proposition has been before the philosophical public long enough for this ontological fallacy to merit immunity from any more exhumations.

Of course, there is a sense in which any character whatsoever involves existence. I mean that if it is true that something is green or square or north of London that something must exist. What has a quality or stands in a relation or is of a kind *ipso facto* exists. Being a Prime Minister involves existence; for if a man is Prime Minister he exists. (This is not a *significant* inference. But the object of the Ontological Argument was to show that there is one (peculiar) character of which we only know

to start with that it *might* characterise something, from the analysis of the constitution of which we could discover that it *does* characterise something.)

But though it would be a contradiction to say 'this is a bicycle but it has not got two wheels in tandem' and nonsense to say 'this is a bicycle but it does not exist', it is not a contradiction or nonsense to say 'nothing has *deitas*'.

There is then no way of arguing validly to the existence of something of a certain description from non-empirical premisses, namely from premisses about the characters the combination of which is symbolised by the description. There is no way of demonstrating *à priori* particular matters of fact. Inferences to the existence of something, if there are any, must be causal inferences and inferences from the existence of something else. Nor are there any 'demands of reason' which can make us accept as proofs of existence combinations of propositions which contain an overt fallacy.

And if philosophy is or contains or rests on metaphysics and has no 'subject-matter' unless it has to do with a subject, the existence of which is established only in this way, then there is no such philosophical science as metaphysics and no such thing as philosophy. But, as I see no force in the argument that philosophy would have no subject-matter unless it had access to a special entity, I do not find myself alarmed by this threat.

But this is not the end of the story. For in Section 7 Mr. Collingwood goes on to a new line of argument, which he appears to think is merely an expansion or continuation of the previous one. To state briefly his new point, he argues that logicians enunciate principles of logic in propositions which themselves exemplify those principles. So their propositions exist. So the essence of the principles of logic involves the existence of examples of them.

The argument is so extraordinary that I must quote the relevant passages *in extenso*. After maintaining that logic has thought for its subject-matter and that it does not give a merely descriptive account of it, he says on page 129: 'But neither is logic merely normative. A purely normative science would expound a norm or ideal of what its subject-matter ought to be, but would commit itself to no assertion that this ideal was anywhere realised. If logic were a science of this kind, it would resemble the exact sciences; it would in fact be, or be closely related to, mathematics. The reason why it can never conform to that pattern is that whereas in geometry, for example, the subject-matter is triangles, etc., and the body of the science

consists of propositions about triangles, etc., in logic the subject-matter is propositions, and the body of the science consists of propositions about propositions. In geometry the body of the science is heterogeneous with its subject-matter; in logic they are homogeneous, and more than homogeneous, they are identical; for the propositions of which logic consists must conform to the rules which logic lays down, so that logic is actually about itself; not about itself exclusively, but at least incidentally about itself.

'It follows that logic cannot be in substance merely hypothetical. Geometry can afford to be indifferent to the existence of its subject-matter; so long as it is free to suppose it, that is enough. But logic cannot share this indifference, because, by existing it constitutes an actually existing subject-matter to itself. Thus, when we say 'all squares have their diagonals equal', we need not be either explicitly or implicitly asserting that any squares exist; but when we say 'all universal propositions distribute their subject', we are not only discussing universal propositions, we are also enunciating a universal proposition; we are producing an actual instance of the thing under discussion, and cannot discuss it without doing so. Consequently no such discussion can be indifferent to the existence of its own subject-matter; in other words, the propositions which constitute the body of logic cannot ever be in substance hypothetical. A logician who lays it down that all universal propositions are merely hypothetical is showing a true insight into the nature of science, but he is undermining the very possibility of logic; for his assertion cannot be true consistently with the fact of his maintaining it.

'Similarly with inference. Logic not only discusses, it also contains reasoning; and if a logician could believe that no valid reasoning anywhere existed, he would merely be disbelieving his own logical theory. For logic has to provide not only a theory of its subject-matter, but in the same breath, a theory of itself; it is an essential part of its proper task that it should consider not only how other kinds of thought proceed, and on what principles, but how and on what principles logic proceeds. If it had only to consider other kinds of thought, it could afford to deal with its subject-matter in a way either merely normative or merely descriptive; but towards itself it can only stand in an attitude that is both at once. It is obliged to produce, as constituent parts of itself, actual instances of thought which realise its own ideal of what thought should be.

'Logic, therefore, stands committed to the principle of the Ontological Proof. Its subject-matter, namely thought, affords

an instance of something which cannot be conceived except as actual, something whose essence involves existence'.

I shall find it hard to condense within reasonable limits my objections to this argument. But my main objects are to show first that this argument has nothing to do with the Ontological Argument, and second that it has no tendency to establish the general conclusion that the propositions of logic are not hypothetical. But I have one or two subsidiary bones to pick with Mr. Collingwood as well.

The first of the subsidiary bones is this. Mr. Collingwood is at pains to show that a logician who *denies* the existence of any instances of logically regular thinking must be wrong because he himself is producing an instance of that which he denies to exist. Now this might, *per accidens*, be so (though a man might, if he troubled, deny the occurrence of genuine singular propositions without producing one, or argue against the occurrence of syllogisms in Disamis by syllogisms in Baroco). But it has no bearing on the point. For (general) hypothetical propositions do not *deny* the existence of their subjects, they only do not affirm or imply their existence. So a man who maintained that all the propositions of logic are (general) hypotheticals would not be denying the existence of anything. So his exposure as himself a producer of propositions would no more disconcert him than a lecturer on canine diseases would be disconcerted by hearing the bark of a dog.

The second subsidiary bone is to point out that when Mr. Collingwood argues that if logic was purely normative 'it would resemble the exact sciences: it would in fact either be, or be closely related to, mathematics', he does not seem to remember that this is precisely what is desired for logic by many logicians, past and present.

The third is this. It is not peculiar to logical propositions that they themselves (sometimes, not generally) belong to the subject-matter which they discuss. The English grammarian writes grammatically about grammar; the educationist lectures instructively about lecturing instructively; the signalling instructor may signal instructions about signalling to his pupils; Horace writes his *Ars Poetica* in poetry. Have *these* anything to do with the Ontological Argument?

I suppose Mr. Collingwood would reply that it is accidental if the principles of grammar or elocution or poetry are conveyed in vehicles which themselves exemplify those principles, but it is necessary that logicians' propositions should instantiate the principles which they themselves propound.

But even this seems to me not to be so. For after all one can talk about singular propositions in general propositions, negative propositions in affirmative ones, relational in attributive and attributive in relational propositions. One can reason about the syllogism in non-syllogistic arguments and *vice versa*.

But let us suppose that sometimes logicians have to formulate logical principles or rules in propositions which are instances of them. Even so, the writer or reader might and usually would attend to what the propositions say without noticing that the propositions themselves were cases in point, just as he may study grammar without noticing that the grammarian is keeping the rules. And even if he noticed it he might still not use the instances as illustrations. It is indeed difficult to attend, so to speak, twice at once to a given proposition, namely once to what it says and once to the fact that it exemplifies the rule that it states.

So when Mr. Collingwood says that 'no such discussion' [as logic] 'can be indifferent to the existence of its own subject-matter', while it is not easy to see which of several things he means, it is easy to see that in all the possible meanings of the expression what he says is false.

(a) If he means that the reader of a logical text-book or the hearer of a logical lecture cannot understand the logical principles which are stated unless he uses the actual statements of them as illustrations, then this is false. For we very seldom find that this is the case, and when it is we very seldom do use the statement as an illustration; and generally we do not require an illustration at all.

(b) If he means that logical principles cannot be stated save in propositions which exemplify them, then this is in general false. How could, *e.g.*, a singular proposition tell us what a singular proposition is? And how will Mr. Collingwood state the principle of the syllogism in a syllogism?

(c) If he means that a given logical principle involves that a given logician should write or speak what he does write or speak about it, I challenge him to deduce from the principle of the syllogism the actual sentences which Mill or Russell propounds about it. The only thing of which we can say that it would of logical necessity be different from what it is, if a given proposition of Mill or Russell had been omitted or worded differently, is Mill's *System of Logic* or Russell's *Principia Mathematica*. And they are books and not logical principles. If a sheep exists its wool exists; and if Mill's *Logic* exists its 365th proposition exists; but its existence is involved not by the truth of the principle

which it states, but by the existence of the volume of which it is a part.

(d) But Mr. Collingwood avers that when a general proposition is propounded by a logician which happens to be *about* general propositions, then it is incidentally about itself. And this suggests (I hope I am wrong in discerning this suggestion) that it is part of the *meaning* of this proposition that it should exist: *i.e.*, that the truth of what the proposition states depends upon and so implies that this proposition should be written or spoken as and when and where it is.

Now, of course, the word 'about' is very ambiguous; but, in one sense of it, to say that a proposition is about itself is to commit the simplest of type-fallacies. But anyhow Mr. Collingwood's own argument only entitles him to use the term 'about' in this other sense, namely that a proposition is 'about' x when it applies to x . So 'dogs are carnivorous' is 'about' Fido in the sense that Fido is a dog and so is carnivorous. But we have long since accepted with Mr. Collingwood the view that (general) hypothetical propositions, while they may apply to this or that square or this or that case of tuberculosis, do not depend for their truth on this being a square or that being a case of tuberculosis. In the same way, then, if a logician's proposition is an instance of a logical principle of which it is the statement, the principle will apply to the proposition, but it will not imply its existence. (How *could* a perfectly general truth like a logical principle imply a particular spoken or printed occurrence?) But of course we only need to ask the simple question, How can we discover what propositions have been propounded by logicians? to see the position. For the answer is that we must read their books or hear their lectures, or infer from testimonies and traditions: that is, we can only discover this sort of fact empirically. We do not employ the Ontological Argument.

After all, Mr. Collingwood did say that there was only one case where essence involves existence, namely, where the essence of God, or the Good, or Being implied its existence. But here what is being hailed as necessarily existing is not God or the Good or Being but this and that remark of this and that logician. So that even if logicians could not help uttering logically regular propositions (which alas! they *can* help), this supposed necessitation would be something quite different from the supposed analytic necessity of existing which the Ontological Argument ascribes to God or the Good or Being. All that Mr. Collingwood's argument amounts to is that a man will be a bad logician unless he tells the truth and reasons validly or obeys the laws

of logic which it is his professional business to expound. But there is, unfortunately, no logical contradiction in asserting that someone is a bad logician.

It is clear then that the fact that thousands of logicians' propositions exist or have existed has no tendency to show of what logical form the propositions of logic are or must be.

And it is clear too that the Ontological Argument is quite a different argument from this one of Mr. Collingwood's which tries to establish the categorical nature of the propositions of logic from the fact that some logical principles are exemplified in the propositions which are employed to formulate them.

I hope Mr. Collingwood will not find that my criticisms are vitiated by 'subjective idealism'.

II.—A CALCULUS FOR PROPOSITIONAL CONCEPTS.

BY ALBERT A. BENNETT AND CHARLES A. BAYLIS.

THE following is offered as basis for an abstract deductive structure capable of interpretation not only extensionally, for example as the traditional two-valued calculus of truth values, but also intensionally, as a calculus of unasserted propositional meanings. In this latter interpretation the calculus deals with those relations which hold on the basis of the structure and not of the significance or truth values of these propositional meanings, or as they are here called, propositional concepts.

The purely abstract uninterpreted structure is sharply differentiated from the meaningful rules by which it is developed.¹ Further, these rules are simply explicit statements which grant permission to manipulate the expressions of the abstract system in certain ways. This is in contrast to two other possible methods of approach: (1) that of Peirce, Schroeder, and Huntington, in which the system remains abstract and the deduction proceeds by external application of a logic assumed tacitly to be familiar and acceptable, the common method of studying postulational developments in mathematical fields: (2) that ostensibly followed in *Principia Mathematica*,² and less formally by previous writers, for example, De Morgan and Couturat, in which the logical principles used in the deduction are merged within the system with the study of the formal symbols. The method of this paper is that of C. I. Lewis in *Symbolic Logic*,³ except that he purports to assign meanings to the expressions of his otherwise abstract system.

¹ This is in accordance with the procedure suggested by J. Nicod, "A Reduction in the Number of the Primitive Propositions of Logic," *Proceedings of the Cambridge Philosophical Society*, vol. 19, 1916, pp. 32-42; by Alonzo Church, "A Set of Postulates for the Foundation of Logic," *Annals of Mathematics*, 2nd series, vol. 33, 1932, pp. 346-366; by Bernard Notcutt, "A Set of Axioms for the Theory of Deduction," *MIND*, vol. xliii, N.S., No. 169, Jan., 1934, pp. 63-77; and by others.

² By A. N. Whitehead and B. Russell, 2nd edition, vol. 1, 1925.

³ By C. I. Lewis and C. H. Langford, 1932, ch. vi. and app. ii., both written by Lewis.

The elaboration of *Principia Mathematica*, and the more explicit investigations of later writers such as Lewis, have made evident the fact that various implicational relations exist. In *Symbolic Logic*¹ five systems are indicated with different properties for the implicational relation symbolized by \supset . By our rather arbitrary choice of the single postulate, P4, instead of a combination of postulates each weaker than P4, the implication here used assumes a less ambiguous status than Lewis's \supset . But other problems of a similar sort may arise, such as that suggested by the fact that although equality certainly should imply reciprocal implication, the converse may or may not hold in a system. Again, there are various tautologies such as "a implies a", "a is equal to a", "a or not-a", etc.; and a given system may or may not be explicit as to the relations among these tautologies.

Our system is proposed as one having certain features of simplicity, as evidenced by its economy of primitive operations and postulates. As a result of this economy certain relations among tautologies are here provable, the status of which might have been left ambiguous or settled otherwise with a more lavish array of primitive symbols. Here as in *Symbolic Logic* equality and reciprocal implication are equivalent.

A fundamental feature of the present system is the clear cut distinction here drawn between formulas (interpretable as unasserted propositional concepts) and logograms (interpretable as asserted propositions). It is our impression that a system of logic, to be effective for establishing proofs by the method of *reductio ad absurdum*, must be equipped to infer conclusions from hypotheses which are entertained but not established, conclusions which follow from the structure of the hypothesis and do not depend upon its proved truth. The technique should be adequate, for example, to demonstrate that the abstract symbolic paraphrase of the proposition " $a = b$ reciprocally implies not- $a =$ not- b ", is a logogram irrespective of the relations which may hold in fact between a and b .

The elements of this study are abstract symbolic *formulas*, expressed always in terms of small letters. So wholly abstract are these formulas that they need not even be thought of as variables. They are given the desired flexibility by the rules of procedure. Of special importance is the sub-set of formulas called *logograms*. Certain formulas are taken as *primitive*, others are *imported*, and the rest are *constructed*, each in a finite sequence of steps by means of certain *operations* in accordance with prescribed

¹ Pp. 500-502.

rules. Similarly, four logograms are *postulated*; nine others, of the special type known as *importational logograms* (analogous to definitions), are *introduced by fiat*. All other logograms in the system may be *derived* from the postulated and importational logograms each in a finite sequence of steps in accordance with prescribed rules.

The system thus developed is included under abstract Boolean algebra but is subjected to additional conditions. The postulates of a set proposed by E. V. Huntington¹ are here adopted, among others, with the following modifications: "Equals," =, appears here as an operation (rather than as an assertion of relation) and is subjected to postulates and rules on the same basis as other operations. The hypothetical element in Huntington's postulates 4·3, 4·4, 4·6 (as mentioned parenthetically in his preceding paragraph) is here explicitly avoided.

Proofs paralleling those of Huntington suffice for the derivation of all the formal propositions of Section A of *Principia Mathematica*. The addition of a fourth postulated logogram, together with the form adopted for our seventh rule, makes possible the derivation of analogues of all of Lewis's symbolic propositions² (except his existential ones) without the introduction of modality as a special concept. The symbol \prec , our analogue of Lewis's \supset (as used symbolically), is defined in terms of =. The relation between \supset and \prec is shown to be $\mid (a \supset b = 1) = (a \prec b) \mid$.³ In contrast to Huntington's recent interpretation of Lewis's informal system,⁴ where most of the theorems involve logical concepts, the emphasis here is upon logograms which are assigned only structural significance.

Rules, unlike logograms, are intensionally significant propositions expressed in terms of certain logical concepts whose meaning in each case is assumed to be sufficiently clear to avoid ambiguity in the restricted use of them that is made in this work. Eight rules are postulated; others are derived. Four of the postulated rules, R4-R7, serve to establish logograms and are essentially Lewis's rules⁵ formalized. Rules R1-R3 and R8 serve to establish formulas. Lewis does not formally distinguish

¹ In his "Fourth Set" in "New Sets of Independent Postulates for the Algebra of Logic, with Special Reference to Whitehead and Russell's *Principia Mathematica*," *Transactions of the American Mathematical Society*, vol. 35, No. 1, Jan., 1933, pp. 280-286. In a correction Huntington pointed out that postulate 4·5 is redundant and may be dropped.

² *Op. cit.*, ch. vi, and App. ii.

³ S·4 below; cf. also 3·31 and 3·32.

⁴ "Independent Postulates Related to C. I. Lewis's Theory of Strict Implication," *MIND*, vol. xliii, N.S., No. 170, April, 1934, pp. 181-198.

⁵ *Op. cit.*, pp. 125-126.

as we do between the primitive operations and the primitive rules, R1-R3, which give the status of the results of these operations, as is necessary for a fully abstract treatment. Neither Lewis nor Huntington mention any analogue of R8.

Rules are here expressed non-verbally, using abbreviational symbols of two types: (1) abbreviations for the logical concepts involved, such as \rightarrow for "validates," $*$ for "is a formula" and $||$ for "is a logogram,"¹ and (2) generic symbols for formulas. The commonest type of such generic symbols are the capital letters, A, B, C, . . . M, N. Any one of these denotes some formula without specification of just which formula. For example one rule of the system is that the "equality" of any two formulas is a formula. This is stated in symbols $[(A*) \& (B*)] \rightarrow [(A = B)*]$. Any permutation of these capital letters yields merely an optional variant of the same rule, e.g., $[(C*) \& (D*)] \rightarrow [(C = D)*]$.

When in the statement of rules attention needs to be called to the components of the formulas denoted generically, recourse is had to such generic symbols as $P(a, b, \dots n)$ and $P(A, B, \dots N)$. The expression denoted in a given application by any of these generic symbols may, but need not, contain a small letter for each letter of the generic symbol. Again, the function indicated by P may be complicated or may be simply a single small letter. Thus $P(a, b, \dots n)$, for example, may denote a or $a + b$ or c' , etc.

With symbols of the type $P(a, b, \dots m, n)$ are associated dependent symbols such as $P(a, b, \dots m, a)$, this being the result of inserting a for n wherever this latter appears in the expression denoted by $P(a, b, \dots m, n)$. Thus, if, for example, $P(a, b, \dots m, n)$ denotes $a + n$ where $b, \dots m$ do not appear, then $P(a, b, \dots m, a)$ denotes $a + a$. No identical insertion need be mentioned. Thus the insertion in $a + b$ of c for a yields $c + b$. Again, the simultaneous insertion in $a + b$ of c for a and d for b yields $c + d$ because the original expression $a + b$ is free of c and hence the indicated insertion of d for b is without effect.

In any given application of a rule its generic symbols denote specific formulas. A statement of the rule in terms of specific formulas is said to be a *particularization* or particular instance

¹ This notation is substantially that of Hilbert and Ackermann: *Grundzüge der theoretischen Logik*, 1928, p. 36. This book and the more recent work, Hilbert and Bernays: *Grundlagen der Mathematik*, Bd. 1, 1934, use only the material implication of *Principia Mathematica*. In Place of \supset they use the notation \rightarrow . This is in contrast to Huntington's use of \rightarrow , which we follow.

of the generic form of the rule. Because of the significance of its generic symbols a rule is said to validate every derivation authorized by any of its particularizations. A partial particularization of a rule is called a *specification*.

The fact that expressions given below and stated to be formulas are indeed such according to our rules, is usually so obvious that explicit proof of construction is generally omitted. Formal *demonstration* of the derivation of logograms, on the other hand, is ordinarily given. Derivation of rules involves an understanding of the meaning of the postulated rules. The derived rules here given are, like demonstrations, not wholly abstract. They are convenient devices for economy which might have been omitted. In the actual derivation of logograms the corresponding steps might have been applied directly, thus involving only the primitive rules and logograms. Rules 3.23 to 3.33, paralleling results by Huntington, are listed partly for purposes of comparison.

For each logogram a corresponding rule could be derived by *generalization* in view of R6. Thus, corresponding to $|a = (a'b')(a'b')'|$ is the rule $[(A^*) \text{ and } (B^*)] \rightarrow |A = (A'B')(A'B')'|$. It is to be noted that rules always involve hypotheses. Since the primary interest here is in logograms, and since the corresponding rules because of their hypotheses are more complicated in statement, such rules are given only where specific use of them is to be made.

An arbitrary new expression, for which X is reserved as generic symbol, may be brought into the system by means of an importational logogram, always of the type $|A = X|$ where A denotes some previously given formula. R8 assures that X then denotes a formula.¹

AN INTERPRETATION.

The system delineated below is subject to the following interpretation:

a, b, c, \dots, n propositional concepts, *i.e.*, unasserted propositional meanings.²

¹ Our indebtedness to Whitehead and Russell, C. I. Lewis, and E. V. Huntington in connection with their published work is sufficiently obvious. We wish also to express our personal obligation to Lewis and to Huntington for their generously given critical comments upon a draft of this paper, which have led us to modify the formulation of our introduction.

² For example, corresponding to the asserted propositional meaning " a strictly implies a " is the propositional concept " a strictly implying a ." Corresponding to the propositional concept " a being strictly equivalent to b " would be the assertion " a is strictly equivalent to b ," but this in general may not be asserted.

| | |
|---------------|--|
| * | is a propositional concept. |
| | is an asserted propositional concept ; is an assertion. |
| $a = b$ | a strictly implying and being strictly implied by b ; a being strictly equivalent to b . |
| ab | a and b . |
| a' | the contradictory of a . |
| $a + b$ | a or b . |
| $a \supset b$ | b or the contradictory of a ; a materially implying b . |
| $a \sim b$ | ab or $a'b'$; a being materially equivalent to b . |
| $a < b$ | a strictly implying b . |
| 0 | a contradiction ($= aa' = bb' = \dots = nn'$). |
| 1 | a tautology ($= a + a' = b + b' = \dots = n + n'$). |

As a special case of this interpretation only those propositional concepts might be considered which are truth concepts. Then the following interpretation holds :

| | |
|---------------------|---|
| a, b, c, \dots, n | a_0 being true, b_0 being true, c_0 being true, \dots n_0 being true. |
| * | is a truth concept. |
| | is a truth assertion. |
| $a = b$ | a_0 and b_0 having necessarily the same truth values. |
| ab | a_0 being true and b_0 being true. |
| a' | a_0 being false. |
| $a + b$ | a_0 being true or b_0 being true. |
| $a \supset b$ | a_0 being false or b_0 being true. |
| $a \sim b$ | a_0 and b_0 having factually the same truth values. |
| $a < b$ | (a_0 being false or b_0 being true) being necessary. |
| 0 | a contradiction ($= aa' = bb' = \dots = nn'$). |
| 1 | a tautology ($= a + a' = b + b' = \dots = n + n'$). |

The formal treatment now starts.

ABBREVIATIONS FOR CERTAIN LOGICAL CONCEPTS.

| | |
|-------------|------------------------------|
| "and" | & |
| "validates" | \rightarrow (read "dart"). |

This symbol appears only in the statement of rules and in their application in demonstrations. The dart symbolizes a

relation which justifies acceptance of the proposition symbolized at its right when and only when the proposition symbolized at its left has been established.

“is a formula” * (read “star”).

The star is placed after an expression which is a formula, but is not itself part of the formula. In such an expression as ab^* the star refers to the expression as a whole and not to b alone. A generic symbol followed by a star means that the expression denoted by the symbol is a formula.

“is a logogram” | | (read “bars”).

The bars enclose an expression which is a logogram, but are not themselves part of the logogram. Enclosing a generic symbol the bars mean that the expression denoted by the symbol is a logogram.

Dots

Dots are used in such expressions as a, b, c, \dots, n to indicate an unspecified number of elements.

Parentheses, brackets (), [].

These are used as in algebra to group terms and to separate parts within an expression. Following custom $ab + c$ is to be understood as $(ab) + c$, not as $a(b + c)$. Similarly, $a + b = (c + d)e$ means $(a + b) = [(c + d)e]$, not $[a] + [b = (c + d)e]$, and not $[(a + b) = (c + d)][e]$.

Remark

Rem.

Abbreviations used in demonstrations :

Each step in a demonstration, *Dem.*, is labelled at the right by parenthetical small Roman numerals, and the authority for each step is given in brackets at the left, followed by a colon. Substitutions are indicated by the abbreviation *Sub* followed by reference to the expression in which the substitution is to be made. This is followed by a colon, after which is written the expression substituted followed by a diagonal line and the expression for which it is substituted. For example, [Sub P3: a/b]: $|a = (a'a')(a'a')'|$ means that the substitution in postulate 3 of a for b yields $|a = (a'a')(a'a')'|$ and this expression is validated by the rule called *Sub*. Particularizations and specifications are sometimes similarly indicated with the abbreviation *Part* or *Spec* respectively replacing the abbreviation *Sub*. If a second authorization is needed for a given step it is indicated following a semicolon placed after the first authorization, and so on. Sometimes *Hyp* will be used to indicate the whole of the hypothesis of the theorem to be proved, where it is desired to repeat the hypothesis in successive

steps of the *Dem.* By a hypothesis is here meant the expression at the left of a major \rightarrow , $<$, or $=$. The last step of a *Dem.*, which always involves repeating the logogram or rule to be proved, is indicated by the abbreviation \therefore . As certain steps become familiar and obvious they are omitted for the sake of economy. Their first omission is remarked.

INITIAL DATA.

I. FORMULAS AND THEIR CONSTRUCTION.

Primitive Formulas: a, b, c, \dots, n .

Primitive Operations: equating, juxtaposing, priming, as in $a = b, ab, a'$ respectively.

Postulated Rules:

$$R1 \quad [(A^*) \& (B^*)] \rightarrow [(A = B)^*]$$

The $=$ operation on two formulas yields a formula.

$$R2 \quad [(A^*) \& (B^*)] \rightarrow [(AB)^*]$$

The juxtaposition of two formulas yields a formula.

$$R3 \quad [(A^*)] \rightarrow [(A')^*]$$

The $'$ operation on a formula yields a formula.

II. LOGOGRAMS AND THEIR DERIVATION.

Postulated Logograms:

$$P1 \quad | ab = ba |$$

$$P2 \quad | (ab)c = a(bc) |$$

$$P3 \quad | a = (a'b')(a'b')' |$$

$$P4 \quad | (aa')' = (a = a) |$$

Postulated Rules:

$$R4 \quad [(A^*) \& (B^*) \& | A | \& | A = AB |] \rightarrow | B | \quad Inf.$$

If, by a logogram, a formula is equated to the juxtaposition of itself and a formula, the latter formula is a logogram. (Inference).

$$R5 \quad [(A^*) \& (B^*) \& | A | \& | B |] \rightarrow | AB | \quad Adj.$$

If two formulas separately are logograms, their juxtaposition yields a logogram. (Adjunction).

$$R6 \quad [(P(a, b, \dots, n)^* \& | P(a, b, \dots, n) | \& (A^*) \& (B^*) \& \dots \& (N^*)] \rightarrow | P(A, B, \dots, N) | \quad Sub.$$

If in a logogram constructed from primitive formulas by the operations of the system, these primitive formulas are simultaneously replaced throughout by given formulas, the result is a logogram. (Substitution).

- R7 $P(a, b, \dots, m, n)^* \rightarrow [(a = b)[P(a, b, \dots, m, b)] = (a = b)[P(a, b, \dots, m, b)][P(a, b, \dots, m, a)]$ |
 If $P(a, b, \dots, m, n)$ is a formula, then
 $(a = b)[P(a, b, \dots, m, b)] = (a = b)[P(a, b, \dots, m, b)]$
 $[P(a, b, \dots, m, a)]$ is a logogram.

Rem. Lewis's rule of equivalence, which he calls Substitution (a), is paralleled not by R7 but by our derived rule, 1.1. The derived rules of Section 1 below suffice to replace R7 for Boolean algebras.

III. IMPORTATION.

Importational Logograms :

- I1 | $(a'b')' = a + b$ |
 I2 | $(ab')' = a \supset b$ |
 I3 | $(ab')'(a'b)' = a \sim b$ |

Rem. The wave, \sim , here replaces the \equiv of *Principia Mathematica*.

- I4 | $(a = ab) = (a < b)$ |
 I5 | $(\dots ((ab)c) \dots)n = abc \dots n$ |
 I6 | $(\dots (a')' \dots)' = a'' \dots '$ |
 I7 | $(\dots ((a + b) + c) + \dots) + n = a + b + c + \dots + n$ |

Rem. Importational logograms I8 and I9 are introduced after 3.3.

Postulated Rule :

- R8 $[(A^*) \& | A = X |] \rightarrow (X^*)$

An expression to which a formula is equated by an importational logogram is a formula.

THEOREMS.

PART ONE (Results valid for every Boolean algebra).

1. Some basic properties of "equivalence" :

- 1.1 $[P(a, b, \dots, m, n)^* \& (A^*) \& (B^*) \& \dots \& (M^*) \& | A = B | \& | P(A, B, \dots, M, B) |] \rightarrow | P(A, B, \dots, M, A) |$
Eq.

If, of two formulas equated in a logogram, the former is substituted for the latter in any one place in any logogram in which this latter formula appears, then the result is a logogram (Equivalence) ("Equivalence is substitutive").

Dem. [Spec Adj : $A = B/A, P(A, B, \dots, M, B)/B$]:

Hyp $\rightarrow | (A = B) [P(A, B, \dots, M, B)] |$ (i)

[Sub R7 : $A/a, B/b, \dots, M/m$]: Hyp $\rightarrow | (A = B)$
 $[P(A, B, \dots, M, B)] = (A = B)[P(A, B, \dots, M, B)]$
 $[P(A, B, \dots, M, A)] |$ (ii)

[Spec Inf : $(A = B) [P(A, B, \dots, M, B)]/A,$
 $P(A, B, \dots, M, A)/B$; (i); (ii)]: \therefore

1.2 $| a = a |$ ("Equivalence is reflexive.")

Dem. [Spec 1.1 : $a = n/P(a, b, \dots, m, n)$]:

$[(A^*) \& (B^*) \& | A = B |] \rightarrow | A = A |$ (i)

[Part (i) : $a/A, (a'b')(a'b')'/B$]:

$| a = (a'b')(a'b')' \rightarrow | a = a |$ (ii)

[(ii); P3]: \therefore

1.3 $[(A^*) \& (B^*) \& | A = B |] \rightarrow | B = A |$ ("Equivalence is symmetric.")

Dem. [Sub 1.2 : B/a]: $(B^*) \rightarrow | B = B |$ (i)

[Spec 1.1 : $b = n/P(a, b, \dots, m, n)$]:

$[(A^*) \& (B^*) \& | A = B | \& | B = B |] \rightarrow | B = A |$ (ii)

[(ii); (i)]: \therefore

1.4 $[(A^*) \& (B^*) \& (C^*) \& | A = B | \& | B = C |] \rightarrow | A = C |$
 ("Equivalence is transitive.")

Dem. [Spec 1.1 : $n = c/P(a, b, \dots, m, n)$]: \therefore

1.5 $[(A^*) \& (B^*) \& | A = B |] \rightarrow | A' = B' |$

Dem. [Spec 1.1 : $n' = b'/P(a, b, \dots, m, n)$]:

$[(A^*) \& (B^*) \& | A = B | \& | B' = B' |] \rightarrow | A' = B' |$ (i)

[Sub 1.2 : B'/a]: $(B^*) \rightarrow | B' = B' |$ (ii)

[(i); (ii)]: \therefore

1.6 $[(A^*) \& (B^*) \& (C^*) \& (D^*) \& | A = B | \&$
 $| C = D |] \rightarrow | AC = BD |$

Dem. [Spec 1.1 : $nd = bd/P(a, b, \dots, m, n)$]: $[(A^*) \&$
 $(B^*) \& (C^*) \& (D^*) \& | A = B | \& | BD = BD |]$
 $\rightarrow | AD = BD |$ (i)

[Sub 1.2 : BD/a ; (i)] Hyp $\rightarrow | AD = BD |$ (ii)

[Spec 1.1 : $an = bd/P(a, b, \dots, m, n), C/A, D/B$]:
 $[(A^*) \& (B^*) \& (C^*) \& (D^*) \& | C = D | \&$

$| AD = BD |] \rightarrow | AC = BD |$ (ii)

[(ii); (iii)]: \therefore

Rem. 1.2, 1.3, 1.4, 1.1, correspond respectively to postulates A, B, C, D of Huntington.¹ For the sake of economy the use of the familiar properties of $=$ covered by them may be made hereafter without separate reference in each case.

¹ In his "Fourth Set".

2. The commutative and associative properties of juxtaposition :

Rem. Proof of such logograms as $| (ab)(cd) = (ac)(bd) |$ or $| (abc)d = (bcd)a |$, etc., involving only the commutative and associative rules for juxtaposition follows from P1 and P2 by use of the rules of Section 1, in the usual fashion. It will be unnecessary to refer explicitly to each use of such properties.

3. Some fundamental logograms and rules :

Rem. The proofs of the following (save for 3.20-3.22, 3.33, 3.34) may be taken without substantial change from Huntington's "Fourth Set," using here however juxtaposition in place of addition. For this reason they are not here exhibited. The sequence given approximately parallels Huntington's order.

3.1 $| aa' = a'a'' |$

3.2 $| a'' = a |$

3.3 $| aa' = bb' |$

I8 $| aa' = 0 |$

I9 $| 0' = 1 |$

3.4 $| (aa')' = 1 |$

3.5 $| [(A^*) \& (B^*) \& | A' = B' |] \rightarrow | A = B |$

3.6 $| a1 = a |$

3.7 $| aa = a |$

3.8 $| a + 0 = a |$

3.9 $| a + a' = 1 |$

3.10 $| a + b = b + a |$

3.11 $| (a + b) + c = a + (b + c) |$

3.12 $| ab = (a' + b')' |$

3.13 $| a + a = a |$

3.14 $| a0 = 0 |$

3.15 $| a + 1 = 1 |$

3.16 $| a = (a + b)(a + b') |$

3.17 $| a = ab + ab' |$

3.18 $| a(a + b) = a |$

3.19 $| a + ab = a |$

3.20 $| a \supset a = 1 |$

Dem. [3.4; I2]: \therefore

3.21 $| a \supset b = a' + b |$

Dem. [I2]: $| a \supset b = (ab')' |$

(i)

[(i); I1]: \therefore

3.22 $| a' + b = a' + ab |$

Dem. [Sub 3.17: $b/a, a/b$]: $| a' + b = a' + ab + a'b |$

(i)

[Sub 3.19: a'/a]: $| a' + a'b = a' |$

(ii)

[(i), (ii)]: \therefore .

- 3.23 $[(A^*) \& (B^*) \& | A'B = O | \& | B'A = O |] \rightarrow | A = B |$
 3.24 $[(A^*) \& (B^*) \& | AB = O | \& | A + B = 1 |] \rightarrow | A' = B |$
 3.25 $[(A^*) \& (B^*) \& | AB = A |] \rightarrow | A + B = B |$
 3.26 $[(A^*) \& (B^*) \& | A + B = B |] \rightarrow | AB = A |$
 3.27 $[(A^*) \& (B^*) \& | AB = A |] \rightarrow | AB' = O |$
 3.28 $[(A^*) \& (B^*) \& | AB' = O |] \rightarrow | AB = A |$
 3.29 $[(A^*) \& (B^*) \& | AB = A |] \rightarrow | A' + B = 1 |$
 3.30 $[(A^*) \& (B^*) \& | A' + B = 1 |] \rightarrow | AB = A |$
 3.31 $[(A^*) \& (B^*) \& | A < B |] \rightarrow | A \supset B = 1 |$
 3.32 $[(A^*) \& (B^*) \& | A \supset B = 1 |] \rightarrow | A < B |$
 3.33 $[(A^*) \& (B^*) \& | A < B | \& | B < A |] \rightarrow | A = B |$

Dem. [1.4]: $[(A^*) \& (B^*) \& | A = AB | \& | B = BA |] \rightarrow | A = B |$ (i)

[(i); I4]: \therefore .

- 3.34 $[(A^*) \& (B^*) \& | A < B |] \rightarrow | B' < A' |$

Dem. [3.25]: $[(A^*) \& (B^*) \& | A = AB |] \rightarrow | B = B + A |$ (i)

[(i); 1.5]: $[(A^*) \& (B^*) \& | A = AB |] \rightarrow | B' = B'A' |$ (ii)

[(ii); I4]: \therefore .

Rem. These rules may be compared with the logograms of Section 8.

4. The distributive relations :

Rem. The proofs given by Huntington for the distributive relations although adequate appear unnecessarily complicated. In their place the following is offered.

- 4.1 $| a + bc = (a + b)(a + c) |$

Dem. [Sub 3.16: $a + bc/a$]: $| (a + bc) = (a + bc + b)(a + bc + b') |$ (i)

[Sub 3.19: $b/a, c/b$]: $| a + bc + b = a + b |$ (ii)

[Sub 3.17: $b'/a, c/b$]: $| a + bc + b' = a + bc + b'c + b'c' |$ (iii)

[Sub 3.17: c/a]: $| a + bc + b'c + b'c' = a + c + b'c' |$ (iv)

[(i), (ii), (iii), (iv)]: $| a + bc = (a + b)(a + c + b'c') |$ (v)

[Sub (v): $b/c, c/b$]: $| a + bc = (a + c)(a + b + b'c') |$ (vi)

[(v), (vi); 3.7]: $| a + bc = (a + b)(a + c + b'c')(a + c)(a + b + b'c') |$ (vii)

[Sub 3.18: $a + b/a, b'c'/b$]:

$| (a + b)(a + b + b'c') = a + b |$ (viii)

[Sub (viii): $b/c, c/b$]: $| (a + c)(a + c + b'c') = a + c |$ (ix)

[(vii), (viii), (ix)]: \therefore .

- 4.2 $| a(b + c) = ab + ac |$

Dem. [Sub 4.1: $a'/a, b'/b, c'/c$]:

$| a' + b'c' = (a' + b')(a' + c') |$ (i)

$$\begin{aligned} &[(i); 1.5]: |(a' + b'c')' = [(a' + b')(a' + c')]' | \quad (ii) \\ &[(ii); 3.12]: \therefore \end{aligned}$$

5. Analogues of the formal symbolic postulates of Section A of *Principia Mathematica*:

$$5.1 \quad | 1 = [(a + a) \supset a] | \quad (*1.2 \vdash: p \vee p \supset p)$$

$$Dem. [3.20]: | a \supset a = 1 | \quad (i)$$

$$[3.13]: | a = a + a | \quad (ii)$$

$$[(i), (ii) Eq]: \therefore$$

$$5.2 \quad | 1 = [b \supset (a + b)] | \quad (*1.3 \vdash: q \supset p \vee q)$$

$$Dem. [Sub 3.21: b/a, a+b/b]: | [b \supset (a+b)] = (b' + a + b) | \quad (i)$$

$$[3.9; 3.15]: \therefore$$

$$5.3 \quad | 1 = [(a + b) \supset (b + a)] | \quad (*1.4 \vdash: p \vee q \supset q \vee p)$$

$$Dem. [3.10; 3.21]: | [(a+b) \supset (b+a)] = [(a+b') + (a+b)] | \quad (i)$$

$$[(i), 3.9]: \therefore$$

$$5.4 \quad | 1 = [a + (b + c)] \supset [b + (a + c)] |$$

$$(*1.5 \vdash: p \vee (q \vee r) \supset q \vee (p \vee r))$$

$$Dem. [2.]: | [a + (b + c)] \supset [b + (a + c)]$$

$$= [(a + b + c) \supset (a + b + c)] | \quad (i)$$

$$[(i), 3.20]: \therefore$$

$$5.5 \quad | 1 = [(b \supset c) \supset (a + b \supset a + c)] |$$

$$(*1.6 \vdash: . q \supset r \supset p \vee q \supset p \vee r)$$

$$Dem. [3.21]: | [(b \supset c) \supset (a + b \supset a + c)]$$

$$= [(b' + c)' + (a + b)' + (a + c)] | \quad (i)$$

$$[(i)]: | [(b \supset c) \supset (a + b \supset a + c)]$$

$$= (bc' + a'b' + a + c) | \quad (ii)$$

$$[3.17]: | a = ab + ab' | \quad (iii)$$

$$[Sub 3.17: c/a]: | c = bc + b'c | \quad (iv)$$

$$[(ii), (iii), (iv)]:$$

$$| [(b \supset c) \supset (a + b \supset a + c)]$$

$$= (ab + ab' + a'b' + bc' + bc + b'c) | \quad (v)$$

$$[Sub 3.17: b'/a, a/b]: | ab' + a'b' = b' | \quad (vi)$$

$$[Sub 3.17: b/a, c/b]: | bc' + bc = b | \quad (vii)$$

$$[(v), (vi), (vii)]:$$

$$| [(b \supset c) \supset (a + b \supset a + c)] = (ab + b' + b + b'c) | \quad (viii)$$

$$[(viii); 3.9; 3.15]: \therefore$$

Rem. The verbal postulate, *1.7, of *Principia Mathematica* is the analogue of R3. The analogue of postulate *1.71 follows from R2 and R3 by use of I1 and R8. Our analogue of *1.1 is given in the statement under Abbreviations as to the significance of the dart as employed in the statement of our rules. In the interpretation suggested R4 (Inf.) becomes an analogue of *1.1, but as an abstract

symbolic statement it does not have the significance of *Principia's* verbal *1.1.

6. Analogues of postulates B1-B5 of C. I. Lewis : ¹

$$6.1 \quad | ab < ba | \quad (B1. pq \cdot \supset. qp)$$

Dem. [P1 ; 3.7 ; I4] : \therefore

$$6.2 \quad | ab < a | \quad (B2. pq \cdot \supset. p)$$

Dem. [P1 ; 3.7, I4] : \therefore

$$6.3 \quad | a < aa | \quad (B3. p \cdot \supset. pp)$$

Dem. [3.7, I4] : \therefore

$$6.4 \quad | (ab)c < a(bc) | \quad (B4. (pq)r \cdot \supset. p(qr))$$

Dem. [P2 ; 3.7 ; I4] : \therefore

$$6.5 \quad | a < a'' | \quad (B5. p \cdot \supset. \sim(\sim p))$$

Dem. [3.2 ; 3.7 ; I4] : \therefore

Rem. I3 is equivalent to Lewis's 11.01, $p \vee q = \sim(\sim p \sim q)$.

PART TWO (results not valid throughout Boolean algebras).

7. Logograms not dependent upon the full force of P4, including analogues of B6-B8 of C. I. Lewis :

$$7.1 \quad | 1 | \quad (\text{Lewis's } 13.5, p \vee \sim p)$$

Dem. [3.6 ; I4] : $| a < 1 |$ (i)

[Sub (i) : $a = a/a$] : $| (a = a) < 1 |$ (ii)

[(ii), 1.2 ; Inf.] : \therefore

$$7.2 \quad | (a = b) = (b = a) |$$

Dem. [Sub 1.2] : $| (a = b) = (a = b) |$ (i)

[3.4 ; P4] : $| 1 = (b = b) |$ (ii)

[(i), (ii) ; 3.6] : $| (a = b) = (a = b)(b = b) |$ (iii)

[Part R7 : $b = n/P(a, b, \dots, m, n)$] :

$| (a = b)(b = b) = (a = b)(b = b)(b = a) |$ (iv)

[Sub 1.2] : $| (b = a) = (b = a) |$ (v)

[(iii), (v) ; 1.6] : $| (a = b)(b = a) = (a = b)(b = b)(b = a) |$ (vi)

[(iii), (iv), (vi) ; 1.4] : $| (a = b) = (a = b)(b = a) |$ (vii)

[Sub (vii) : $a/b, b/a$] : $| (b = a) = (b = a)(a = b) |$ (viii)

[(vii), (viii) ; P1 ; 1.4] : \therefore

Rem. This logogram, 7.2, is comparable to 1.3, but, for = as here used, is not the direct analogue of any theorem of a general Boolean algebra. 7.2 (weaker than P4) might have been made a postulate as it suffices for this section,

¹ *Op. cit.*, p. 493.

but P4 is required in section 8 to establish the analogue of Lewis's definition, 11-02, and hence it is used here for the proof of 7.2.

$$7.3 \quad | (a < b)(b < c) < (a < c) | \quad (\text{B6. } p \supset q \cdot q \supset r : \supset \cdot p \supset r)$$

$$\text{Dem. [I4]: } | [(a < b)(b < c) < (a < c)]$$

$$= [(a = ab)(b = bc) = (a = ab)(b = bc)(a = ac)] | \quad (\text{i})$$

$$[\text{Part R7: } a = an/P(a, b, \dots, m, n), bc/a]:$$

$$| (bc = b)(a = ab) = (bc = b)(a = ab)(a = abc) | \quad (\text{ii})$$

$$[\text{Part R7: } a = cn/P(a, b, \dots, m, n), ab/b]:$$

$$| (a = ab)(a = abc) = (a = ab)(a = abc)(a = ac) | \quad (\text{iii})$$

$$[(\text{ii}), (\text{iii})]: | (bc = b)(a = ab)$$

$$= (bc = b)(a = ab)(a = abc)(a = ac) | \quad (\text{iv})$$

$$[(\text{ii}), (\text{iv})]: | (bc = b)(a = ab)$$

$$= (bc = b)(a = ab)(a = ac) | \quad (\text{v})$$

$$[(\text{v}), (\text{i}); 7.2]: \therefore$$

$$7.4 \quad | a(a < b) < b | \quad (\text{B7. } p \cdot p \supset q : \supset \cdot q)$$

$$\text{Dem. [Part R7: } n/P(a, b, \dots, m, n), ab/a \cdot a/b]:$$

$$| (ab = a)a = (ab = a)aab | \quad (\text{i})$$

$$[\text{I4}; 3.7, 7.2]: | a(a < b) = a(a < b)b | \quad (\text{ii})$$

$$[\text{I4}]: \therefore$$

$$7.5 \quad | (a = O) < (ab = O) | \quad (\text{Lewis's 19-1, } \sim (pop) \supset \sim (pog), \text{ an alternative form of B8})$$

$$\text{Dem. [3.7; 3.17]: } | (a = O) = (a = O)(ab + ab' = O) | \quad (\text{i})$$

$$[\text{Part R7: } ab + nb' = O/P(a, b, \dots, m, n), O/a,$$

$$a/b]: | (O = a)(ab + ab' = O) = (O = a)(ab + ab'$$

$$= O)(ab + Ob' = O) | \quad (\text{ii})$$

$$[3.14; 3.8; 7.2]:$$

$$| (a = O)(ab + ab' = O) = (a = O)(ab + ab' = O)(ab = O) | \quad (\text{iii})$$

$$[\text{I4}]: | (a = O)(ab + ab' = O) < (ab = O) | \quad (\text{iv})$$

$$[(\text{iv}), (\text{i})]: \therefore$$

$$7.6 \quad | (ab = O)' < (a = O)' | \quad (\text{B8. } \diamond (pq) \cdot \supset \cdot \diamond p)$$

$$\text{Dem. [7.5; 3.34]: } \therefore$$

$$7.7 \quad | (a = b) = (a < b)(b < a) | \quad (\text{Lewis's 11-03, } p = q. = : p \supset q \cdot q \supset p)$$

$$\text{Dem. [Sub R7: } b = n/P(a, b, \dots, m, n), ab/b]:$$

$$| (a = ab)(b = ab) < (b = a) | \quad (\text{i})$$

$$[\text{I4, 7.2}]: | (a < b)(b < a) < (a = b) | \quad (\text{ii})$$

$$[3.7]: | (a = b) = (a = b)(a = bb) | \quad (\text{iii})$$

$$[\text{R7}]: | (a = b)(a = bb) = (a = b)(a = bb)(a = ab) | \quad (\text{iv})$$

$$[(\text{iv}), (\text{iii}); \text{I4}]: | (a = b) = (a = b)(a < b) | \quad (\text{v})$$

$$[\text{Sub (v)}]: | (b = a) = (b = a)(b < a) | \quad (\text{vi})$$

$$[(v), (vi); 3.7; 7.2]: |(a = b) = (a = b)(a < b) \\ (b < a)| \quad (vii)$$

$$[I4]: |(a = b) < (a < b)(b < a)| \quad (viii)$$

$$[(ii), (viii): 3.33]: \therefore$$

8. Logograms requiring P4 in full.

$$8.1 \quad |(a = a) = 1|$$

Dem. [P4; 3.4]: \therefore

$$8.2 \quad |(a < b) = (ab' = O)| \quad (\text{Lewis's } 11.02, p \supset q. \\ = . \sim \diamond (p \sim q))$$

$$\text{Dem. } [8.1; 1.6]: |(a < b)1 = (a < b)(abb' = abb')| \quad (i)$$

$$[R7; I4]: |(a = ab)(abb' = abb') < (abb' = ab')| \quad (ii)$$

$$[(ii), (i); I4, 7.2]: |(a < b)1 < (ab' = abb')| \quad (iii)$$

$$[(iii); 3.6; I8; 3.14]: |(a < b) < (ab' = O)| \quad (iv)$$

$$[R7; I4]: |(ab' = O)(ab + O = ab) < (ab + ab' = ab)| \quad (v)$$

$$[3.8; 8.1]: |(ab + O = ab) = 1| \quad (vi)$$

$$[3.17; I4]: |(ab + ab' = ab) = (a < b)| \quad (vii)$$

$$[(v), (vi), (vii) 3.6] |(ab' = O) < (a < b)| \quad (viii)$$

$$[(iv), (viii); 3.33]: \therefore$$

Rem. Compare 3.27, 3.28.

$$8.3 \quad |(a = b) = (a' = b')|$$

$$\text{Dem. } [\text{Sub } 8.1]: |(b' = b') = 1| \quad (i)$$

$$[\text{Part } R7: n' = b'/P(a, b, \dots, m, n); I4]:$$

$$|(a = b)(b' = b') < (a' = b')| \quad (ii)$$

$$[(i), (ii); 3.6]: |(a = b) < (a' = b')| \quad (iii)$$

$$[\text{Sub } (iii): a'/a, b'/b, 3.2]: |(a' = b') < (a = b)| \quad (iv)$$

$$[(iii), (iv); 3.33]: \therefore$$

Rem. Compare 1.5, 3.5.

$$8.4 \quad |(a \supset b = 1) = (a < b)|$$

$$(\text{Lewis's } 18.7, p \supset q. = . \sim \diamond \sim (p \supset q))$$

$$\text{Dem. } [\text{Sub } 8.3]: |(a' + b = 1) = (ab' = O)| \quad (i)$$

$$[(i); 3.21; 8.2]: \therefore$$

Rem. Compare 3.31, 3.32.

III.—ARISTOTLE'S DOCTRINE OF SUBSTANCE (II).

BY D. R. COUSIN.

IN a previous article,¹ I confined myself as much as possible to the discussion of one only of two aspects which I then distinguished within Aristotle's doctrine of substance or "being".² I now realise that the over-simplification was even greater than I had thought. In order to complete the outline of his teaching, I shall have to add to my previous discussion an investigation not only of what Aristotle means when he speaks of "the substance of" this or that but also of what he means when he says that this or that is (or is not) "substance".

The recognition of these as distinct aspects in Aristotle's teaching is, I think, necessary if we are to learn from him anything of value about how we ought to think of the universe in which we find ourselves. But I must not be taken to mean that Aristotle himself separated them, and I am not confident that he would have accepted the distinction if confronted with it. This is not merely because his teaching is vague or uncertain. We find discussions here and there which are admirably clear, and which, taken each by itself, would show that the word *οὐσία* has several perfectly distinct meanings, but is capable, in a given context, of indicating one or another of these quite unambiguously. The difficulty arises out of Aristotle's assumption that anything to which the word substance can be applied at all must be such that the word applies to it in all of these senses at once. No doubt it is human to find difficulty in believing that things meant by the same word can be in any important sense different. But in Aristotle, in spite of the masterly analysis of which he is capable, the disease reaches such a height that I can only envy the moderation of the Provost of Oriel when he remarks that in the notion of substance two notions are "somewhat unsatisfactorily blended".³

¹ In *MIND*, vol. xlii., N.S., No. 167 (July, 1933), pp. 319 ff.

² It is perhaps necessary to say that I use "substance" throughout as a rendering of *οὐσία* in all its senses.

³ W. D. Ross, *Aristotle's Metaphysics*, vol. ii., p. 161.

It may help to make my problem clearer if I call attention here to the fact that when Aristotle says "so-and-so is substance", or "so-and-so is the substance of something", he may be doing either of two things. He may be defining substance, and in that case he will be expressly answering my question. But he may, on the other hand, be making a synthetic judgement; and in that case my problem—*viz.*, to understand the sense in which he is using the word—will have to be solved, if it can be solved, by a consideration of the context and, in particular, of the terms with which substance is contrasted or of the grounds, if any, which he adduces in support of his statement.

In the present article I wish merely to supplement what I have written previously. I shall not, therefore, touch except incidentally upon Aristotle's doctrine of substance as it is worked out in relation to the doctrine of categories, or upon the criteria of substance that it is the subject (leading to the view that matter is substance), and that it is a "this-somewhat" and capable of separate existence. I shall begin by discussing two accounts which Aristotle offers of "the substance of" a thing, which are equally precise, but not, in his opinion, equally important. They are precise in the sense that we can see that there are some things which they do not mean, not in the sense that it is easy to state in a sentence what they do mean. But we shall find, I think, that in the first sense Aristotle is thinking of the definition of a thing—what it essentially is—by contrast with what it *is*, but only accidentally; while in the second sense he is thinking, though not without confusion, of the explanation of a thing by reference to something external to its nature but not irrelevant to the interest which guides us in naming it. The first may be here called the logical and the second the dynamical conception of the substance of a thing. I shall discuss the logical conception in Section I. and the dynamical in Section II. of this article. I shall then (Section III.) consider certain passages in which Aristotle speaks of "the substance of" a thing, or of "substance" *simpliciter*, in a sense much more indefinite and indeed scarcely definable in intellectual, as distinct from emotional, terms. Finally (Section IV.), I shall conclude with a summary of results.

I.

In the present section I shall attempt to elucidate the phase of Aristotle's doctrine which I have called "the logical conception of the substance of a thing" by considering its relation (a) to the phase which is associated with the doctrine of the

categories, and (b) to the distinction between universal and particular. We may then (c) inquire what positive characteristics distinguish it.

(a) There are not wanting passages from which we should most naturally draw the conclusion that this conception has with the "primary substance" of the *Categories* nothing but the name in common. Thus we read about the substance of triangle and line,¹ of numbers,² of the circle,³ of disease,⁴ of good.⁵ Nor need this appear strange, if we remember that *οὐσία*, although historical circumstances have imposed upon us the rendering "substance", really means nothing more precise than "being". Some of these examples may be due to the influence of the Platonic doctrine, which—in Aristotle's interpretation at least—tended to reify universals, and to make of them—even the universals of things that are not, in the sense of the category, substances—substances in their own right. But others, it seems, can only be naturally interpreted if we suppose that Aristotle is not thinking of the categories at all.

We may recall that the doctrine of categories itself is, in one of its aspects, a classification of the essential being, the *τί ἐστι*, or being *καθ' αὐτό*, of the ten different kinds of thing.⁶ A category is the *summu genus* of the things of which it is predicated. Now the possibility of assigning to anything its appropriate category surely suggests, if it does not imply, the possibility of determining its being still more closely. If we can ask what it, together with an indefinite multitude of things distinguishable from it in all respects but category, essentially is, we can ask also what it alone essentially is. The answer to this question, whatever the thing about which it is asked, and whatever, consequently, its category, might reasonably be called its being or substance.

But a different, and in some ways a more characteristic, way of regarding the distinctions of category is found in those passages in which what is classified is evidently the ten ways in which one and the same thing—which is variously regarded as a primary substance or as matter—can be said to "be".⁷ In accordance with this way of thinking, we find that Aristotle's deliberate account of the conception of "the substance of" a

¹ *An. Post.*, i., 4, 73a, 36.

² *Met.*, v., 14, 1020b, 7.

³ *Met.*, vii., 11, 1036a, 33.

⁴ *Met.*, vii., 7, 1032b, 3, 4.

⁵ *Met.*, v., 18, 1022a, 15.

⁶ Cf. Ross, *Aristotle's Metaphysics*, vol. i., pp. lxxxiv., 307; Joseph, *An Introduction to Logic*, 2nd ed., pp. 50-51.

⁷ *An. Post.*, i., 22, 83a, 21-23, 30-33, b11-15; *Met.*, vii., 1, 1028a, 13-20.

thing is not, after all, independent of the conception of the category of substance. Thus, in considering the suggestion that the substance of a thing is to be identified with its essence, he denies that it is possible to say, about anything in a category other than that of substance, "what it is" in the same sense in which it is possible to say what a substance is.¹ By this he clearly means more than merely that there is a certain inappropriateness in the term "substance" as applied to the essence of things which are not substances. So much we might be prepared to grant. But what he says is that only substances (in the sense of the category) have essences in the primary sense. Things in other categories may be described in a formula which says "what they are", but this is only in a secondary sense a definition, and the nature set out in such a formula is only in a secondary sense a statement of the essence. The reason which leads Aristotle to draw this rather obscure distinction is indicated by his remark that the derivative sense in which such things can be defined resembles the derivative sense in which they can be said to exist.² He is evidently influenced by his metaphysical view that things not in the category of substance have no independent existence, but exist only as the predicates of some substance. In deference to this view, he is inclined to think that substances are not only—as is obvious—the most important but also the only proper subjects of discourse and investigation. And no doubt the distinction between essential and accidental predicates is easier to draw in the case of substances than in the case of things which are not, like substances, complex.

But for all that, I cannot help thinking that Aristotle has fallen into error here. For there seems no reason why the fact that a thing is not independently real should prevent us from offering an accurate formulation of such reality as it has. Such a formula seems to be identical in its logical nature, and to have the same title to be called a definition, whether the definiendum is a substance like "man" or a quality like "white" or "black".³

We may conclude, as a result of this discussion, that Aristotle's *employment* of the conception of "the substance of" a thing shows it to be wholly independent of the doctrine of categories. When he comes to offer a reflective account of the conception, however, he is led by his preoccupation with the metaphysical doctrine of the sole independent reality of substance to limit

¹ *Met.*, vii., 4, 1030a, 11-b13.

² *Ibid.*, 21.

³ *Met.*, x., 7, 1057b, 8.

(illogically) the application of "the substance of" a thing, in the sense of what it essentially and peculiarly is, to the case of substance to the exclusion of terms in other categories.

(b) The restriction of the question "What is the substance or essence of this thing?" to the category of substance leaves open certain possibilities which we must now examine. For the category of substance, as *summum genus*, comprehends subordinate genera, species, and individuals. We have now to inquire whether Aristotle would admit the propriety of the question in relation to all of these, and if not, to which of them it should in his opinion be restricted.

We have seen that the reason for limiting the conception to the category of substance at all was the ontological primacy of substance. Since this ontological primacy, as expounded in the *Categories*, belongs in the full sense only to the primary substance or concrete individual, we might expect the question to be restricted to primary substances. We should then be allowed to ask what a primary substance essentially and peculiarly is, and we should expect to be told either its genus or its species or something peculiar to itself. With this line of thought, passages like that in which Aristotle denies that species like "man" and "horse" are substance,¹ and those in which he seems to speak of a form peculiar to the individual,² appear to agree.

If this were correct, problems enough would remain. But unfortunately matters are not nearly so simple.

In the first place, it is not certain that the passages in which Aristotle seems to deny that the species, etc., are the substance of some individual really mean this. For what they deny is that the species, etc., are "substance"; and the meaning of this is far from clear. What he says may really be directed against the theory of separate Forms, and he may intend to deny, not that these are the essence of that of which they are

¹ *Met.*, vii., 10, 1035b, 27-31.

² *Met.*, xii., 5, 1071a, 28; cf. v., 18, 1022a, 25-29; vii., 4, 1029b, 14; c. 11, 1037a, 7-10. The passages cited by Dr. Ross (*Aristotle*, p. 170, n. 3) do not appear to be relevant. *Met.*, vii., 13, 1038b, 14 is ambiguous, but in all probability what Aristotle means is that the universal cannot be substance because it is predicated of a plurality of *species*, and it is to the species, rather than the individual, that substance is said to be peculiar. *De An.*, ii., 1, 412a, 6-9 does indeed indicate that it is in respect of its form that a thing is called *τὸδε τι*, but a comparison with *Met.*, ix. 7, 1049a, 35 (and still more with *Physics*, i., 7, 190a, 32 ff.) should warn us against taking for granted a consistent application of this expression to the individual substance alone.

the Forms, but that they are individual substances existing in addition to the members of the species which they define.¹

And in the second place, it is not possible to assume the doctrine of the *Categories*. When Aristotle speaks of the substance or essence of a thing, he may indeed mean by the "thing" a primary substance, but he is much more often thinking of a species, which he constantly treats as a logical subject,² and which, owing to its peculiar relation to the concrete individual or primary substance, comes to acquire in Aristotle's mind a similar ontological status.

The difficulty, as Mr. Joseph has pointed out,³ is not gratuitous. It arises from the nature of the things which Aristotle is trying to describe. For while no doubt everything that exists is individual, our thinking about them is only valuable, and indeed only possible, in so far as we treat each individual as an instance of this or that universal—a universal realised only in instances which are all in some more or less relevant respect and degree mutually distinct. The problem inevitably arises: How to distinguish those characters in virtue of which the individuals are members of the species from those in which as individuals they differ; or—to look at the matter from a slightly different point of view—how to distinguish those characters which a thing must have in order to be a member of that species from those which it may or may not have without affecting its membership of the species. The former are essential to the individual as a member of that species, the latter are accidental to it, again as a member of that species.

Aristotle's way of expressing this is to say that it is the species which is defined.⁴ (The definition is the formula which states "what it is",⁵ or what is its essence or substance.) The inconvenience, that this way of speaking must almost inevitably result in the attribution to universals of a being and existence analogous to that of their instances, was not altogether evident to him, owing to the fact that he did not clearly formulate to himself the question "Of what is this the substance?"

It seems clear, then, that Aristotle holds that the question "What is the essence of this?" is always a question about a subject in the category of substance. But within that category he does not seem to have fairly faced the question raised by the distinction between universal and particular. His language,

¹ Cf. on this point Mure, *Aristotle*, p. 187, n. 1.

² Cf., e.g., *Met.*, vii., 6, 1031a, 15 ff.; and c. 13.

³ *An Introduction to Logic*, c. iv., esp. pp. 81 ff., p. 72, n. 4.

⁴ *Met.*, vii., 4, 1030a, 11-17.

⁵ *Top.*, i., 5, 101b, 39.

however, is appropriate to the species rather than to the individual.

(c) If this is the context in which we may speak of "the substance of" a thing, what does Aristotle mean when he uses the phrase? The answer may be found by a consideration of two contrasts in which it commonly stands in his writings. We read about the substance of a thing in contrast (i) with its matter and (ii) with its accidents.

(i) The contrast with matter is of course frequent. As a rule, substance appears in such contexts conjoined with some word, such as form (*εἶδος*)¹ or shape (*μορφή*)², which is unambiguously correlative with matter. But passages are not wanting in which "substance" stands by itself as the term contrasted with matter.³ These passages are important, because they show that Aristotle is not merely saying that the vague word "substance" can be applied to the precise notion of form, but is actually using the word "substance" in the precise sense = form.⁴

If the conception of "the substance of" a thing is in this way used by Aristotle as an aspect, contrasted with matter, distinguishable within the thing "of" which it is the substance, what is the character of this aspect in virtue of which it is distinguished from matter? Wherein does the opposition of matter and substance consist? The distinction is for preference illustrated by Aristotle rather than defined.⁵ We are told that matter is related to form as the bronze to the circle or statue which is made out of it. When pressed, however, Aristotle will say that matter is "that which is not something-or-other actually, but is it potentially" while the contrasted element is something-or-other.⁶ We may say, then, that for Aristotle

¹ *Met.*, v., 18, 1022a, 15; vii., 8, 1033b, 17; c. 12, 1038a, 26; ix., 8, 1050b, 2; xiii., 8, 1084b, 19.

² *De Caelo*, i., 9, 278a, 13-20; *De Gen. et Corr.*, ii., 9, 335b, 5-7; *Part. An.*, ii., 1, 646b, 1-2; *Met.*, viii., 2, 1043a, 22-26.

³ *De Caelo*, ii., 13, 293b, 15; *Meteor.*, iv., 12, 389b, 28; *ibid.*, 390a, 6; *Part. Anim.*, i., 1, 641a, 27; *Met.*, i., 6, 987b, 21; viii., 3, 1043b, 12.

⁴ This does not apply to *Met.*, vii., 3, 1029a, 21-24, where, in saying that substance is predicated of matter while being the subject of things in all other categories, Aristotle seems to be thinking of the Category rather than of the essence.

⁵ *Phys.*, i., 7, 191a, 7-12.

⁶ *Met.*, viii., 1, 1042a, 27-28 (cf. also vii., 3, 1029a, 20). I think it best to render *τόδε τι* in this vague way, because the context, while it shows that Aristotle was probably thinking of substances in the sense of the category, does not show that he was thinking of them so definitely as to exclude things in other categories. Nor is the form to which matter is

the substance of a thing, as contrasted with its matter, is everything that is definite and intelligible in it, everything that it can be significantly said to be.

(ii) But while the account of what Aristotle means by "the substance of" a thing which we should gather from a study only of the passages in which it is contrasted with matter is thus general, his real meaning is, of course, much more precise. Not all the determinate characters which a thing may have would be called its substance. This point is expressed by the contrast of "the substance of" a thing with its accidents, and by the identification of its "substance" with its "being" (*τί ἐστι*)¹—which includes the genus—, or more precisely with its essence (*τί ἦν εἶναι*).²

We may, I think, take it that in this sense the substance of a thing and its essence are simply two names for an identical conception. What we are told about the essence, therefore, may be taken without more ado to apply to the substance. We learn, then, that the substance of a thing is what the thing is "in virtue of itself" or *per se*. Thus, "being you is not being musical, since you are not by your very nature musical".³ Lower down, we learn further that the essence (or substance) of each thing is peculiar to that thing,⁴ and even identical with it.⁵

In the attempt to interpret these statements we are hampered by the difficulty, already noted, of determining the subject to which they are applicable. For what a thing is "in virtue of itself", and what is peculiar to or identical with it, must be very differently understood according as we mean by the "thing" on the one hand the individual as such, or on the other the species

correlative always substantial (*cf. Met.*, viii. 1, 1042a, 32 ff.). For a parallel to the use of *τὸδε τι* without restriction to the category of substance, *cf. Phys.*, i. 7, 190a, 32.

¹ *An. Post.*, i. 22, 83a, 21, 39-b5; *Top.*, i. 5, 102a, 32 ff.

² *Met.*, vii. 4, 1029b, 1-2, 13-16; *cf. Top.*, i. 5, 101b, 38 ff.

³ *Met.*, vii. 4, 1029b, 14.

⁴ *Met.*, vii. 13, 1038b, 10.

⁵ *Met.*, vii. c. 6. Dr. Ross is not, I think, consistent in his interpretation of the chapter. In his introductory comment (*Aristotle's Metaphysics*, vol. ii., p. 176), he treats the question as if it concerned the identity of terms denoting either a *summun genus* or a species with their individual instances. But on p. 179 he recognises that the question discussed throughout the chapter is a question about universals. If the question whether Socrates is the same as his essence is different from the question whether man is the same as the essence of man, it cannot be correct to say that the doctrine that each thing is the same as its essence means that "to be a man sums up the whole substantial, permanent nature of each individual man". The "thing" with which "to be a man" (or rather "two-legged animal") is identical can only be the species man. But I am far from suggesting that Aristotle was clear about this.

as such or—what is perhaps the same thing more accurately stated—the individual taken as a member of a species.

If we suppose the individual as such to be meant, these statements must mean that the substance of each individual is that in virtue of which it is that particular individual and no other. This is impossible as an interpretation of Aristotle. Even if modern philosophy is entitled to regard the determination of individuality as theoretically possible by reference to Space-Time as a frame, in the light of the Aristotelian system the account of individual differences could be no more than a chapter of accidents. Moreover, such an interpretation, which would find the principle of individuation in form, is inconsistent with Aristotle's regular doctrine, which finds the principle of individuation in matter.¹

We are forced, then, to the alternative view. The approach to it may be made easier by asking ourselves whether we should really mean by the substance or essence of an individual the characters which it has, and which no other thing has or can have. And surely we shall answer "No", although the formulation of what we do mean may be far from easy. In Aristotle's way of putting it, we want to know *what* it is, and not what qualities or relations it possesses.² That is to say, we want to know to what species it belongs.³

This raises at once the question "What characters belong to an individual in virtue of its membership of a given species?" or "What are the characters, the possession of which constitutes membership of the species?" And this is the question which Aristotle expresses by asking "What is the substance or essence of a thing?", and which he answers by saying that the substance or essence of a thing is what the thing is in virtue of itself, *i.e.*, what any individual horse is in virtue of being a horse; or is that which is peculiar to or identical with the thing

¹ With *Met.*, xii., 5, 1071a, 28 and the other passages cited p. 172, n. 2, contrast vii., 8, 1034a, 5-8; c. 10, 1035b, 27-31; *De Caelo*, i., 9, 278a, 10-b35.

² *Met.*, vii., 1, 1028a, 36-b2.

³ The distinction between the "fundamental" or "important" elements which constitute the species and the superficial and unimportant elements which we class as accidents may be based, as Mr. Joseph says, on the distinction between those which exhibit a conceptual or necessary connexion and those which do not. I do not see how an account of this, or any other, conception, which contains the word "necessary", can claim to be an ultimate answer to the problem. But for the purposes of the present article it is sufficient that we do draw the distinction. (*Cf.* Joseph, *Introduction to Logic*, c. iv., pp. 76 ff. I am much indebted at this point to the whole chapter.)

itself, *i.e.*, what the "horse" is that we affirm some individual thing to be. His doctrine, then, although in expression it confuses the universal with the individual which is an instance of it, is concerned with the universal—with the species.¹

We must say, then, that the substance of each thing (remembering that by a "thing" we mean a species) is the system of characters which any individual must possess in order to be a member of the species. It is therefore contrasted with accidents, as characters which the members of the species may or may not possess without affecting their membership of the species. More precisely, the substance of a species is the system constituted by a generic character as rendered determinate in the ultimate term of a series of *differentiae*, each of which is relevant to the one proximately more general.² Or, if we are not to hold Aristotle to this rigorous ideal, we may say that the substance of a thing is constituted by a collection of characters of which each taken severally is found in things which are not, as well as in all the things which are, members of the species, but which in their totality are commensurate with the membership of the species.³

By way of conclusion from the discussions of the present section we may, I think, arrive at some such result as this. It is impossible to state quite certainly and unambiguously what Aristotle means when he speaks of "the substance of" this or that. This results from two facts: the first, that he failed to free what is essentially a logical conception from irrelevant associations with the metaphysical doctrine of the categories; and the second, that he failed to formulate his problem in the light of a satisfactory theory of the relation of the species to its members or instances. But in so far as these difficulties can be overcome, we find in his writings a doctrine of the substance or essence of

¹ It is perhaps necessary to take note of the fact that in *Phys.*, iii., 5, 204a, 23, 24, the identity of a thing with its essence is connected with the thing's not being a predicate. This suggests, of course, that Aristotle thinks of the essence as identical with the individual. But I do not think that what Aristotle says here (his argument is a tissue of confusions) invalidates what I have said in the text. What he means by supposing that the infinite is a substance is merely that it is in the category of substance. The distinction between universal and particular is not present to his mind. His meaning in saying that it is not a predicate is the same as what is expressed above (l. 10) by saying that it is not a *συμβεβηκός*, and would have been expressed in the *Categories* by saying that it is not *ἐν ὑποκειμένῳ*. Cf. *Met.*, vii., 3, 1029a, 23, where "substance", although it is predicated of matter, is the subject of which things in other categories are predicated.

² *Met.*, vii., 12, 1038a, 25.

³ *An. Post.*, ii., 13, 96a, 32-35.

things in the first category—and, in a secondary sense, also of things in other categories—as being identical with a specific character constituted and defined *per genus et differentiam*.

II.

In the preceding section we have been discussing Aristotle's meaning in talking about the substance of a thing in a sense in which it is that to which we should point in answer to the question "What is it?" We must now turn to examine a phase of his doctrine in which the substance of a thing is connected not so much with the question "What?" as with the question "Why?" (*διὰ τί* ;). We are turning from the "logical" conception of the substance of a thing, the affinities of which are with the theory of definition and the doctrine of the predicables, to the "dynamical" conception, which has its place in the theory of change and coming-to-be, and in the doctrine of the four causes. And, in Aristotle's view, we are turning from a discussion merely of the correct use of language to the study of the real nature of things.¹ In this section, therefore, we shall be investigating what is for Aristotle a more important sense of the conception of the substance of a thing than that discussed in the section which we have just closed.

We may begin, as before, with the question of the relation of this sense of the conception of substance to the doctrine of categories. As in the case of the logical conception, we find a divergence of usage. Thus, in the chapter (*Met.*, vii., 17) in which he brings up the causal interpretation of the conception of substance, he illustrates it as readily by thunder as by a man or a house;² but, in criticising the account of the substance of things which he attributes to Democritus, he denies that the differentiae proposed are substance, apparently on the ground that the things which they characterise are not "substances" in the highly refined sense which excludes artefacts and even the parts and organs of animals.³ The conclusion suggested by this divergence is that the conception which he is discussing is in reality independent of the distinctions of category, but that his doctrine about it is obscured by a confusion with these distinctions.

The next question for consideration is the relation of this

¹ *Met.*, vii., 17, 1041a, 28 ; cf. c. 4, 1029b, 13, 1030a, 27.

² 1041a 20-30.

³ *Met.*, viii., 2, 1043 a, 4 ; cf., c. 3, 1043b, 21 ; vii., 16, 1040b, 5-16.

conception of the substance of a thing to the "logical" conception which we have just discussed.

From the way in which the doctrine of the four causes is introduced in *Met.*, i., c. 3,¹ we should be justified in taking "the substance of" a thing to be the name of one of its causes. As a cause, it is one of the principles, knowledge of or acquaintance with which constitutes knowledge or understanding of the thing. As one only of the causes, it is contrasted with the efficient and final causes and with matter. It is, of course, clear that Aristotle means by *αἴτιον* something much less precise than what we mean by "cause". In our sense, "cause" corresponds most clearly with his "moving cause", though we should have little difficulty in applying the term to the final cause also. For both of these are things in some sense external to that of which they are the causes, acting upon it *a fronte* or *a tergo*. But form and matter are not things external to that of which they are the "causes". Rather, they are elements distinguished within it. Thus the relation of the formal to the material, as contrasted with the efficient and final causes, is especially intimate; a fact which Aristotle expresses by calling them not only causes but elements (*στοιχεῖα*).² It would appear, then, that by the formal cause Aristotle means precisely the substance or essence of a thing, in the sense which we have examined in the previous section. In calling it a cause, he will be indicating that the substance or essence of a thing is one of the conditions of its being or, if it comes to be, of its coming to be; and that it is consequently one of the things which we must know in order to know the thing.

This conception presents no particular difficulties, and is, I think, in many contexts what Aristotle means. Other passages, however, do raise difficulties. For it is a favourite doctrine with Aristotle that the formal cause, in some cases at least, "coincides" with the efficient or the final or with both.³

In some cases, no doubt, what is meant is fairly straightforward. Aristotle is saying simply that the same thing A is the cause of another, B, in all three senses—that A is the substance or essence of B, and the purpose for which B exists, and the cause of B's movement. And while there may be a difficulty

¹ 983a, 26 ff.

² *Met.*, xii., 4, 1070b, 22 ff.

³ The contrast with matter seems to be maintained, unless Mr. Mure is right in thinking that, for the purposes at least of the theory of demonstration, Aristotle treats the formal cause as "generically embracing material, efficient and final causes". Cf. his translation of the *Posterior Analytics* (Oxford, 1926), note on ii., 11, 94a, 22.

in understanding how the same thing can be an element immanent in B and also externally related to it as its efficient or final cause, it is clear that this difficulty is presented, not merely by some confusion of Aristotle's, but by the nature of the thing which he is attempting to understand—*e.g.*, the soul.¹ In other cases, the difficulty is further mitigated by the admission that the thing which is the efficient cause of B is identical with B not numerically but in species only, as in the case of animal generation (*ἄνθρωπος γὰρ ἄνθρωπον γεννᾷ*)² or of the things brought into being by art, *i.e.*, by a craftsman whose mind is informed by the specific substance or essence of the thing which he is bringing to realisation in a piece of matter of an appropriate kind.³

But in other passages it is clear that Aristotle's meaning is different. When he says that the essence of thunder is to be a noise in the clouds due to the quenching of fire in them, or that the essence of a house is to be a shelter,⁴ he is saying that the substance or essence of these things is *constituted* by the things to which they are related, in the one case by the efficient cause, in the other by the final cause or purpose.

It is evident that there is something true and important to which Aristotle is here calling attention. Briefly, it is the fact that, among the things which are of such importance to us as to have acquired separate substantival names, some are organic wholes, the unity of which consists in causal relations between their elements, while others again owe their importance to functional relations to such wholes, relations which accordingly enter into the connotation of their names. Thus in the case of thunder or an eclipse, the organic whole is a particular sort of noise being generated in a particular way—perhaps by the quenching of fire in the clouds—, or a loss of light being caused by the interposition of the earth between the sun and the moon. And in the case of a house or any other instrument, or of the organs of an animal, there is an organic whole of vital activity in which they play a part as material conditions. In both cases, these relations form part of what is indicated by the name.

But while this is true, Aristotle's way of describing the facts is confused and self-contradictory.

It is confused. For it fails to distinguish the organic whole within which the causal or functional relations hold from the elements between which these relations hold, and the relations

¹ *De An.*, ii., 4, 415b, 9 ff.

² *Physics*, ii., 7, 198a, 26; *al.*

³ *Met.*, vii., 7, 1032b, 11-14.

⁴ *Met.*, vii., 17, 1041a, 24 ff.; viii., 2, 1043a, 16.

themselves from the terms related. However close the connexion, the difference remains. Thus, if thunder is the organic whole which consists of "the quenching of fire in the clouds producing a noise", let this be the essence of thunder. But the efficient cause involved is not the cause of thunder in *this* sense. The efficient cause is the quenching of fire in the clouds; and this is the cause, not of thunder as just defined, but of a certain kind of noise. It would be more natural, indeed, to give the name of thunder to the noise. In that case the quenching of fire in the clouds *would* be the efficient cause of thunder. But it would *not* be its essence. The essence of thunder would be just to be that particular kind of noise. The causal relation between the quenching of fire and the noise which we call thunder might very well be the essence of the organic whole consisting of the noise thunder and its cause. But that is not what we have now agreed to mean by thunder. It is true that we commonly say, when we discover the cause of a thing, particularly perhaps in the case of a noise, that we have now found out "what it is". But while this may be the explanation of Aristotle's mistake, it does not seem to alter the fact that it is a mistake.

The analysis in the case of the final cause presents some difficulties, owing to the ambiguity with which we speak of a thing's "purpose". We may regard the relation of a thing to its purpose as being essentially the causal relation with the addition that the effect is desired. (We must then say that teleological relations independent of conscious desire are called purposive only by analogy.) If this is correct, our argument will be similar to that which applies in the case of the efficient cause. The essence of house may indeed include the causal relation of something to the other constituents of the whole in which the house is an organic part. But this "something" cannot in that case be the house. It must be the bricks and mortar set up in particular geometrical relations. And if we wish to say that it is the house which stands in the causal relations, we must then say that the house which stands in these relations has a substance or essence (*e.g.*, perhaps the geometrical relations of its material parts) other than these causal relations. Here, too, therefore, Aristotle's description of the facts is confused.

And it is self-contradictory. For it is an attempt to identify conceptions one of which is essentially an external relation (or *relatum*) while the other is an immanent element.

We may say, then, that the valuable elements in Aristotle's

doctrine of substance as cause are these. The contrast expressed in the fourfold classification of causes, between what the thing is—regarded as an element immanent in it—and the efficient and final no less than the material causes, is a valuable reminder of the difference (too often forgotten in popular science) between the quality of a term and its relations to other terms. The attempt to identify the formal with the final or efficient causes, on the other hand, in so far as it is more than the indication of a problem in regard to things which move spontaneously, is based on a mistake, and is valuable only for the attention which it draws to the fact that some quasi-substantival names are in reality relational.

III.

This section is to serve as a kind of rubbish dump to which may be relegated the discussion of certain ways in which Aristotle speaks of "substance" with apparently a minimum of meaning.

And first we may note that there are passages in which he speaks of "the substance of" a thing in a sense much more indeterminate than either of those which we have just been discussing. These passages resemble those which we have just been discussing in conceiving substance as at least different in intension from the substance which is spoken of in connexion with the doctrine of categories. For that substance is not the substance "of" anything.¹ But they differ from them in using the conception of "the substance of" a thing in a sense not necessarily contrasted with its matter. Thus we hear in the *Physics* of those who "identify the nature or substance of a natural object with that immediate constituent of it which taken by itself is without arrangement, e.g., the wood is the nature of the bed, and the bronze the nature of the statue".² In *Met.*, vii., c. 3, we read that "the essence and the universal

¹ A question may arise about the "secondary substances" spoken of in the *Categories*. Are not these, it may be asked, substances "of" the primary substances of which they are predicated? The answer, I suppose, is that they are, viz., in the sense (= essence) which was discussed in the first section of this article. But that is not the sense in which, in the *Categories*, they are said to be substances. Rather, the meaning of that title there is the same as that in which it is applied to the primary substances. Aristotle is saying that the species and genera of primary substances share some of the same characteristics of relative independence, and of being the subject of which other things are predicated, which in an absolute sense are peculiar to the primary substances.

² *Phys.*, ii., 1, 193a, 9-12; cf., *Met.*, i., 3, 983b, 8.

and the genus are thought to be the substance of each thing, and fourthly the substratum".¹ And again in *Met.*, viii., c. 2, Aristotle turns from the study of "the substance which exists as underlying and as matter" to that of "the substance, in the sense of *actuality*, of sensible things".²

This vagueness of intension is still more apparent in the passages which I have kept, for that reason, to the end. They are related to one another by the fact that in each the reference is to the general subject of *Met.*, vii. In these, not merely does the name stand for a conception which is applicable to aspects of a thing so different as form and matter, but in saying "so-and-so is (or is not) substance" Aristotle is using the term so vaguely as not to exclude even application in the sense of the category.

Thus, we are told that form, matter and the compound of the two are substance.³ We are introduced to the conception of which the essence, the universal, the genus and the subject are suggested interpretations, by means of a perfectly clear discussion of substance in which it is contrasted as primary with the other categories as subordinate.⁴ (The further complication that the substance which is so contrasted is clearly a predicate, *i.e.*, is a secondary substance or substantial species, may be here neglected.) And we are even told that the reason why matter, *e.g.*, is not substance is that it has not the characters of "thisness" and "separability" which characterise, as we have already seen, the category of substance.⁵ Yet that the conception is not identical with the category, so that he is not discussing the question whether the universal, *e.g.*, is a substance, *i.e.*, whether it is in that category, is clear from the fact that a main argument against the substantiality of the universal is that it is not peculiar to that "of" which it is the substance, while the substance of a thing is so peculiar.⁶

These examples are, I think, sufficient to show that the meaning is quite vague. Little more seems to be implied than the belief that, among the multiplicity of distinguishable entities which constitute the universe, systematic study can reveal some which have a claim to be considered more important or more fundamental to the being of the whole.⁷

¹ 1028b, 34.

² 1042b, 9-11.

³ *Met.*, vii., 10, 1035a, 2; and elsewhere.

⁴ *Ibid.*, c. 1.

⁵ *Ibid.*, c. 3, 1029a, 26-30. Cf. my earlier article, pp. 332-336.

⁶ *Met.*, vii., 13, 1038b, 9-21.

⁷ Cf., *Met.*, xii., 1, 1069a, 18-21.

IV.

It is time to survey the ground which has been covered, and to attempt briefly to relate the foregoing accounts of the conception of substance to one another and to the account offered in my previous article.

We have seen, then, that there is a well-marked usage of the term "substance" in which it is relative to something or other "of" which it is the substance. Of this relative sense of substance Aristotle gives two accounts. The first points clearly enough to the logical conception of essence, although his exposition is embarrassed by a confusion of this conception with the independent metaphysical conception of substance as the primary being, in the sense of the doctrine of categories. As essence, the substance of a thing is something that the thing is, contrasted, as what it is in virtue of itself, with other things that it is—its accidents. The conception was, we found, ambiguous; but while there were passages which suggested that Aristotle meant by the essence of a thing the peculiar elements of form distinguishing an individual from others even of the same species, his deliberate doctrine points rather to that element in the character of the individual which is fundamental, but which is shared with others, *i.e.*, to the specific element.

In a second account of "the substance of" a thing, we found that Aristotle described it as the cause of its being, or more precisely the cause why it is the thing that it is. In one aspect, this doctrine appeared simply to place the essence, in the sense already described, in relation to matter and the two "external" causes, as a condition both of the being of a thing and of our knowledge of it. But we found other aspects of Aristotle's doctrine less satisfactory, when he attempted to maintain that the essence of a thing could in some cases be equated with its efficient or final cause.

Both of these senses of the term "the substance of" a thing, though they might offer many difficulties in the way of their understanding and acceptance, and although they might even be vitiated by serious confusions, were at least relatively precise, *i.e.*, free from vagueness. But in addition to these, we were forced to recognise other senses in which Aristotle speaks both of "the substance of" a thing, and of a thing's being "substance" *simpliciter*, which are vague (*i.e.*, which are applied to things which can with difficulty be conceived to have any predicates in common) to such an extent that the word appears to lose all meaning. So long as we are speaking of "the substance of"

a thing, indeed, it is at least clear that the conception is not being used in the way appropriate to the doctrine of categories, the sense in which to be a substance is to be a subject and a "this-somewhat" and to be capable of separate existence. But when we speak of "substance" *simpliciter* even this distinction disappears. All that can be said about these two ways of using the conception is that what is expressed is a certain emotional attitude, in the one case towards some aspect distinguishable within a subject of inquiry, in the other towards some kind of thing which might be a subject of inquiry.

The existence of this diversity of usages, some vague and some precise, is a source of no small degree of bewilderment and exasperation to the student of Aristotle. No doubt it is natural that the unambiguous employment of the word substance, in the sense either of the category or of the essence, should be most common in passages where Aristotle's primary concern is with some other topic, *e.g.*, the nature of the infinite or of the soul, and that the ambiguity of the word should force itself most insistently upon our attention when the conception of substance is subjected to analysis for its own sake. But we do not find, even in the books devoted especially to the elucidation of the conception of substance, that the vague sense of the word is restricted to the tentative and provisional stages of an inquiry which results in the establishment of consistently maintained distinctions. On the contrary, Aristotle constantly returns from a passage in which one of the precise senses of substance has been elucidated to the position that substance is this, but is also something else with which this cannot, it seems, conceivably have anything in common. His aim throughout is to reconcile the inconsistencies in the use of the word, and so to justify his claim that First Philosophy, being the study of a single kind of being, is itself a unitary study. We may doubt the success of his attempt, and feel tempted to wish that his recognition of distinctions which he was so well able to draw had not been hindered by this desire for unification. But it is more profitable to take his writings as we find them, and try to master and to utilise the distinctions which, after all, we owe to his analysis.

IV.—FINITISM IN MATHEMATICS (I).

BY ALICE AMBROSE.

IN this paper I shall try to outline the main issue in the controversy now current among mathematicians, roughly over the questions: "Is every mathematical problem solvable?", "Is the law of excluded mean valid universally, that is, for reasoning on finite and infinite classes alike?", "Is the *reductio ad absurdum* method of conclusion in all cases legitimate?", "Is there justification for the use, in mathematical analysis and theory of sets, of the phrases 'all' and 'there exists' when they involve infinite classes or processes?". Despite the seeming lack of connection between these questions, they all have in common an origin in that tangle of difficulties surrounding the word "infinity". This is clear, to illustrate the last question first, if one examines the foci of difficulty: the definition of a real number by Dedekindian section, the proof of the existence of a least upper bound to an aggregate of real numbers, assertion of the existence of sets whose power is \aleph , or 2^{\aleph} , the multiplicative axiom—these present to the finitist school of mathematicians difficulties of such a sort as to make their acceptance questionable. The first, second, and third questions above likewise arise only with propositions involving, expressly or by implication, an infinite range, and likewise precipitate denials by the finitists which the formalist and logistic schools contest. An illustration of the type of statement from which these three questions arise, and of the intimate connection between them, is afforded by Fermat's theorem that "for all $n > 2$, $x^n + y^n \neq z^n$ ", where n , x , y , and z clearly have infinite range. This theorem is held by logicians to be either true or false, regardless of whether there is a method of determining it to be either. That is, it is held that one of the alternatives, "For all $n > 2$, $x^n + y^n \neq z^n$ ", and "There exist an x , y , z , and an $n > 2$ such that $x^n + y^n = z^n$ ", must be true. Generalized, this is, according to the finitists, equivalent to asserting both that every problem is solvable, and that the law of excluded mean is valid universally. Brouwer, representing the finitist school,

observes¹ that Hilbert's axiom of the solvability of every problem is equivalent to claiming unrestricted validity for this logical law. Further—and here the relevance of the question concerning *reductio ad absurdum* arguments appears—if by some method the self-contradictoriness of a general verbal form,² e.g., Fermat's theorem, could be proved, formalists would hold that the existential form usually taken as its negative was a legitimate conclusion. The controversy arises over the tenet of some members of the finitist school that verbal forms in an alternative like the above, which involve some sort of reference to an infinity of objects or operations, are not in fact real contradictories, even though they appear to be so, and hence are not related by the law of excluded mean.³ That is, it is not legitimate to claim that in such alternatives as "All numbers of the form $2^{2n+9} + 1$ are factorable, or there exists one of that form which is prime", " $2\sqrt{17}$ is either algebraic or transcendental", "Either there exists or do not exist three consecutive 7's in the decimal development of π ", one of the pair must be true. Nor is it legitimate to conclude to $(\exists x) \cdot \phi x$ on the sole ground that the verbal forms $(x) \cdot \phi x$ or $\exists x \cdot \phi x$ have been proved self-contradictory.

Inasmuch as the controversy has arisen in connection with specific mathematical examples, I shall treat of it by concentration on the most enlightening of these. The philosophical background formulated by Brouwer for the finitist view with which this paper is on the whole sympathetic I shall entirely omit, as it can well be divorced from the main problem. Brouwer's description of the nature of mathematics, shot through with the crudity of the philosophic intuitionism he so militantly sponsors as basic, will also be omitted. And I shall introduce here only such parts

¹ L. E. J. Brouwer, "Intuitionistische Mengenlehre", *Jahresbericht der deutschen Mathematiker-Vereinigung*, Vol. 28 (1919), pp. 203-204.

² What I shall call "verbal forms" are not necessarily forms of words. The term will cover not only these but any symbolic expression. E.g., "All numbers are even" and " $(n) \cdot (\exists m) \cdot n = 2m$ " are both, in my usage, "verbal forms".

³ This, in fact, represents a much more precise formulation than that usually given. It derives from Weyl, who says, "... Brouwer declares there is no reason shown for believing in the logical law of excluded mean. I should rather say of both statements in question [assertions about series] that one cannot possibly be called the negation of the other..." "Only the actual finding of a determinate number with the property E can give reason for the answer *yes*, and, as I cannot examine all numbers, only the insight that it lies in the *essence* of number to have the property non-E, reason for the answer *no*..." But these two possibilities no longer stand opposed as affirmation and negation." "Ueber die neue Grundlagen-Krise der Mathematik", *Math. Zeit.*, Vol. 10 (1921), pp. 52, 54 resp.

of Hilbert's formalist point of view as raise objections to the finitist methods of dealing with specific examples. These objections will be reinforced by those we all feel inclined to make. They are pretty adequately set forth in the article "Mathematical Logic", by F. P. Ramsey,¹ written in 1926 before he changed his view of the matter. This paper will attempt presenting what the finitist can justifiably claim against these objections, which in many cases will be a statement of what he should claim as opposed to what he does claim. The view presented is guided throughout by certain suggestions made by Dr. L. Wittgenstein in lectures delivered at Cambridge in 1932-35.

Though we shall be considering specific examples from mathematics, it is easier first to examine the generalized verbal form by reference to which the divergence of views has been customarily expressed. It will thus be clearer why the issue has been discussed as one of logic; though I should insist that the controversy over the validity of the law of excluded mean which has stirred philosophers, is essentially a reverberation of the dispute within mathematics. The crux of the difficulty concerns the nature of certain sentences² having the form of those expressing general and existential propositions. In the following alternative made up of one sentence of each kind,—“Either all the elements of a set have the property P or there exists an element of the set having the property non-P”, the natural reaction is to assume that either one or the other of the alternants³ must be true regardless of whether the set is finite or infinite. The formalist sees a need for justification of such an assertion about forms beginning with “all” and “there exists”, and provides a remedy—viz., the axiom of the transfinite,⁴ which in turn is justified on

¹ See *Foundations of Mathematics* (London, 1931), pp. 62-82.

² Not only forms of words come in question here, but other symbolic expressions. See footnote 2, p. 187.

³ I have adopted here W. E. Johnson's term “alternants”.

⁴ This axiom, $A(\tau_x A(x)) \rightarrow A(a)$, asserts that if an object $\tau_x A(x)$ has the property A then all a have it. That is, “All a have the property A” is implied by “The object $\tau_x A(x)$ has the property A”. Also, “There exists an a with the property non-A” is implied by “The object $\tau_x A(x)$ has the property non-A”. Further, not only is the form, “All a have A” implied by “The object $\tau_x A(x)$ has A”; but by a “definition axiom” about “all”, these forms are made equivalent. (A property of a set is thereby reduced to that of a determinate element.) Likewise, by a “definition axiom” about “there exists”, the second implication above becomes an equivalence. It is then argued that since the forms of propositions about $\tau_x A(x)$ are related by the law of excluded mean, so are the general and existential forms which are equivalent to them. See D. Hilbert, “Die Logischen Grundlagen der Mathematik”, *Math. Annalen*, Vol. 83 (1923),

the ground that when joined to the other axioms no contradiction results. The finitist demands that we should be certain of being able to verify or to prove false a verbal form before we hold it to be either true or false in any clear sense of these two words. The difficulty is whether statements about all of an infinity of objects, or about the existence of one among an infinity of objects, can by any possible method be verified. If the members of the subject-classes of general verbal forms cannot be individually exhibited, and if such general forms (and, I should add, existential forms) are not true or false by definition,¹ then there remains no method of verifying or of proving them false. If one cannot show them to be true or false, then the finitist denies that they are true or false. For this reason he denies that in such cases the two apparently contradictory forms are actually so.²

Evidently an assumption is made by the finitists about the nature of the law of excluded mean, namely, that the values in " p or not- p " are significant expressions, as well as being formally each other's negations. In mathematical argument formalists seem content if the forms concerned are merely formally related, provided of course that the forms are such that one of them could be deduced from axioms.³ The finitist assumption as above stated would seem to be the assumption ordinarily made about the

and R. Wavre, "Y-a-t-il une Crise des Mathématiques?", *Revue de Métaphysique et de Morale*, Vol. 31 (1924), pp. 463-465. In later work Hilbert uses the " ϵ -axiom", $A(a) \rightarrow A(\epsilon_x A(x))$, which is deducible from the axiom of the transfinite when the symbol $\tau_x \bar{A}(x)$ is defined as $\epsilon_x A(x)$. On this axiom, see W. Ackermann, "Begründung des 'tertium non datur' mittels der Hilbertschen Theorie der Widerspruchsfreiheit", *Math. Annalen*, Vol. 93 (1924), and P. Bernays' lectures at the Conférences Internationales des Sciences Mathématiques at Geneva, 1933-34.

¹ I mean "true" in the sense in which "All numbers of the form $2n$ are even" and "There is a number of the form $2n + 1$ which is odd" are true. Axioms, and assertions which one can deduce from axioms, have the sort of truth which tautologies have. The above examples are like tautologies in the following sense: To say that "All numbers of the form $2n$ are even" is tautologous, is to say " x is a number of the form $2n$ entails ' x is even'"; and to say that "There is a number of the form $2n + 1$ which is odd" is tautologous, is to say "There is a number of the form $2n + 1$ entails 'There is an odd number'".

² "Is an alternative posed if there is no means of deciding it?" R. Wavre, "Sur le Principe du Tiers Exclu", *Rev. de Métaphysique et de Morale*, Vol. 33 (1926), p. 428.

³ Two of the necessary conditions of deducibility are that the formally contradictory expressions shall not both be self-contradictory, as is the case with certain assertions about the class of all classes not members of themselves, and that they contain no symbols or signs of combination not contained in the original axioms and definitions, i.e., are mathematical.

nature of the values in " p or not- p ". But one sees that their demand for significance for these values is not the usual one when one considers the ordinary answer to the question, "Is it true that there either are or are not three consecutive 7's in the development of π ?" It is, I think, usually assumed that the alternants in this alternative are significant, and that therefore they are related by the law of excluded mean. This is also the assumption of the logistic school. The finitist denies this to be the case in this particular example, thus restricting the values in " p or not- p " to an even narrower range. So, with finitist and logistician, we have different uses of the words "significant expression", and with finitist, logistician, and formalist, different uses of "contradictory", "truth", and "negative". Later on I shall try to clarify, particularly with respect to finitist and formalist claims, what these uses are. For the present, I shall turn to the claims themselves.

I shall deal for the most part with the most extreme and most simple aspect of the finitist protest, which does not touch the theory of sets or mathematical analysis, where scandals have always been comparatively rampant. This simplest aspect relates to statements about the natural numbers. Brouwer, who pointed out difficulties here, not only denied the legitimacy of alternatives posed for number sequences, *e.g.*, for the infinite decimals defining real numbers, such as "Every sequence has the property non-E or there exists one having the property E"; he also denied that alternatives involving the natural numbers—which are not defined by sequences—always allow themselves to be decided. Now some of the finitists' conclusions in the *general* theory of powers and theory of functions, are as obscure and doubtful to me as the rising protests of the formalists indicate they are to them. It is in analysis of specific examples involving integers that the finitist puts his best foot forward. The examples which follow, drawn for the most part from Weyl and from R. Wavre, will elucidate the difficulty about general and existential forms involving natural numbers, and the requirement the finitist makes in connection with them.

Let us examine the alternative, "All numbers of the form $2^{2^n+9} + 1$ are factorable, or there exists a number of this form which is prime". One feels inclined to assume that this is definite and exhaustive. But there is a difficulty about it, which is due to what Wittgenstein would call a "grammatical" peculiarity of general verbal forms whose subject class is infinite, and of existential verbal forms which are taken as their negations. The peculiarity is that unless one can show the attribute "factor-

able" to be a defining property¹ of numbers of this form, there is no way of verifying the general assertion: one can never produce the infinity of instances necessary. And again, there is no way, barring a chance discovery as one ran through the indefinite series of numbers, of verifying the assertion that a prime number of this form exists. Further, one will never accomplish the exhaustion of the infinite sequence of integral values of n required for proving this existential form false. One might by chance verify it, but one could never prove it false. If it is not certain that the alternative can be decided, that is, if there is no method of deciding it other than by examination of cases enumerated, we cannot say that either one of the two alternants is true,² or false, nor therefore that one or other is true. And the finitist makes a much stronger assertion than simply that we do not *know* whether the respective forms are true or false. He asserts that they *are* neither true nor false. This is to say that in some sense of "sense", these verbal forms lack sense.

In passing, I wish to point out that the difficulty in verifying the infinite form, "All numbers of the form $2^{2^{n+9}} + 1$ are factorable", or "There is a number of this form which is prime", is not at all of the same sort as that in verifying that some given number of this form is prime, or is factorable. There is a difficulty in this latter, but it is what one might call a finite one. It is that at present we have no simple method of determining whether such large numbers as $2^{2^{n+9}} + 1$ are factorable or not. We know that for $n = 0, 1, 2, 4$, and 8 , numbers of the form $2^{2^n} + 1$ are prime, and that for $n = 3, 5, 6$, and 7 , they are factorable. One might then expect finitists to hold that so long as this difficulty exists when n is large, it is true that any given number for which $n > 8$ is neither prime nor factorable. But, though they are bound to deny that all numbers of the form $2^{2^{n+9}} + 1$ are either prime or factorable, and that the class of primes in the set $2^{2^{n+9}} + 1$ is either finite or infinite, they must hold that any *given* number of this form, *e.g.*, $2^{2^{512}} + 1$, is either prime or factorable. The point is that the process of deciding this alternative, as contrasted with the other two just given, is a finite one: the number could be tested by a finite number of

¹ *I.e.*, a property such that the assertion that it belongs to all numbers of this form is true on grounds of the axioms or definitions.

² Of course, it is assumed that we are dealing here with two formal contradictions which are not both self-contradictory, and that these contain only those symbols or signs of combination contained in the axioms and definitions.

divisions, if no other less laborious method of deciding the question existed. And this being the case, finitists should hold that one of the alternants of the alternative set up for a *given* number is true.

An important consequence of the finitist position is the restriction placed on modes of concluding to the existence of a mathematical object : The proof that an affirmative general form or a negative existential form leads to a contradiction does not allow one to conclude that the existential form taken as its negative is true—unless one is satisfied with a sense of “true” for the existential form which has nothing to do with verification. That is to say, an important form of mathematical argument, *reductio ad absurdum*, in which one proves the truth of a verbal form from the contradictoriness of its negative, is, in the light of the finitists’ concern with verifiability, not always legitimate.¹ For example, take the alternative, “ $2^{\sqrt{17}}$ is either algebraic or transcendental”. $2^{\sqrt{17}}$ is algebraic if there exists an algebraic equation with integral coefficients of which it is the root.² It is transcendental if the hypothesis of its algebraicity can be reduced to a contradiction. But note that the finitist would not grant the existence of such an equation, nor therefore the algebraicity of $2^{\sqrt{17}}$, if it were merely proved contradictory for the number to be transcendental. The finitist demands that the proof of the existence of such an equation consist in actually determining the equation. And if there is no demonstration permitting establishment of the transcendence or algebraicity of this number, then it is neither transcendental nor algebraic. An alternative is only legitimate if one is able to decide it—to prove directly one of its alternants.³ Our inability to do this in cases like the above has not disturbed the formalist, who assumes that a mathematical object exists if it is proved contradictory for it not to do so (provided, of course, that it is not also contradictory for it to exist). I think it is clear that the actual existence of an object entails the non-contradictoriness of that existence ; but the proved contradictoriness of its not doing so entails its existence only in a formal sense. That is, that an object exists means no

¹ In other cases than the obvious one in which p and not- p are both self-contradictory.

² Note that here an existential form lies at the back of the questionable alternative, and that a general form is not involved. As a matter of fact, the commonest occurrence of the alternative, “Either all elements of the set are P or there exists one which is non- P ”, is in finitist expositions of their general position.

³ R. Wavre, “Logique Formelle et Logique Empiriste,” *Rev. de Mét. et de Morale*, Vol. 33, p. 67.

more in the latter case than that the expression in which the name for it occurs in conjunction with the sign for existence follows from axioms. No stipulation is made about how the deduction is to proceed. It is a central tenet of the finitists that the proved contradictoriness of "All elements of the set have the property P" or "There does not exist an element with the property non-P" is not in their sense a proof of "There exists an element with the property non-P".

Another example, cited by Wittgenstein, is the unverified verbal form, "There exist three consecutive 7's in the decimal development of π ". The only method at present known for verifying this is to continue the development of π in hopes of finding them. Obviously we cannot know that we shall succeed. Let us now consider the example given in substance by Brouwer¹ in connection with the development of π . Let n be the order number of the first decimal preceded by three consecutive 7's. Set $C_i = (-\frac{1}{2})^i$ for $i < n$ and $C_i = (-\frac{1}{2})^n$ for $i \geq n$, where $i = 1, 2, 3, \dots$. C is defined as the limit of the C_i . Here we have a law for the construction of C , for when m decimals of π are given, m figures of C are equally given. The question is whether the real number C so constructed is either rational or irrational. By virtue of its method of construction, the series could not define an irrational number. Must it therefore define a rational one? If some day one should exhibit a number n , then C would be rational, for we should have a repetend in the development of C and a limit to the sequence. We should have demonstrated the existence of two numbers to whose quotient C was equal. But so long as a repetend is not constructed or proved constructible, C is neither rational nor irrational. Further, we cannot say that $C > 0$, or < 0 , or $= 0$.

Integrals which we can evaluate only by approximation methods are in the same case with numbers like C . They do not define numbers which are rational or are irrational. An integral which we do not know how to calculate becomes rational if we happen to discover it equal to some rational number. Peculiar consequences result now for those functions $f(x)$ which are equal to 0 for all rational values of x , and to 1 for all irrational values. The functions are so defined that they take only the values 0 and 1, and seemingly must take one or the other. But when x is neither rational nor irrational, $f(x)$ obviously cannot take either 0 or 1 as values.

¹ Cited and modified by R. Wavre. See "Logique Formelle et Logique Empiriste", p. 74, and "Sur le Principe du Tiers Exclu", p. 426, *Rev. de Mét. et de Morale*, Vol. 33.

There are also other and different cases in mathematics, of alternatives posed which cannot be decided. For example, we cannot say that two points must either be identical or distinct.¹ Suppose we consider the origin of a co-ordinated plane which is densely covered with points to be the centre of a sequence of concentric circles with decreasing radii. To assert that a point is identical with this origin or distinct from it, we should have to show that it was either interior to all the circles or exterior to one of them. To show the first we should have to exhaust an infinite sequence of circles, and to deny that the two points were distinct we should face the same requirement. (This requirement, in fact, makes no sense.) We might be able to affirm that the two points were distinct, but only by a stroke of luck. A like situation arises in connection with the functions of integers, $m = f(n)$ and $m' = f'(n)$, defining the points m and m' . The identity of these functions can be proved by reducing one function to the other algebraically or analytically. The proof of their difference requires the discovery of a number n giving rise to two different numbers m and m' . Consideration that such a discovery might never be made, since one cannot exhaustively exhibit the number series, deters the finitist from assuming that the rejection of their identity entails their difference. This is disturbing to certain proofs of analysis.

One more example will perhaps serve to illustrate clearly the finitist position. This is the unproved theorem of Fermat, mentioned above (p. 186), that for all $n > 2$, the sum of the two n th powers of two positive integers is never equal to the n th power of a third integer. To invalidate this theorem, that is, to verify the assertion of the existence of three integers, x, y, z , such that for some $n > 2$, $x^n + y^n = z^n$, one would be required actually to exhibit the numbers, or to show that within a specified range exhibition was possible. The finitist insists that proof that this theorem led to contradiction would not demonstrate the existence of four numbers invalidating it. Here, again, emerges a point previously set forth as central—that the proved falsity of a general verbal form does not allow one to conclude to the truth of the existential form taken as its negative.

Wittgenstein has exhibited an interesting consequence of our failure so far to prove the existential assertion set up as the negative of Fermat's theorem. Let x, y , and z be confined to the range 0—100, and to n be assigned in turn the integers of the number series. In case $x^n + y^n = z^n$ we should assign 1 to the

¹ Taken from R. Wavre, "Y-a-t-il une Crise des Mathématiques?", *Rev. de Mét. et de Morale*, Vol. 31 (1924), p. 455.

nth place on the right of the decimal point, and if not we should assign 0. With this sort of scheme there would be no way of determining in advance whether $\cdot 011000 \dots$ was larger than or identical with $\cdot 011$.

It is easy to see from these examples why it has been supposed that finitists are denying the law of excluded mean. Also, they have themselves left this impression by holding certain *propositions* to be neither true nor false. I have tried to clarify the issue by distinguishing in my use between "propositions", which by definition are true or false, *i.e.*, meaningful, and the "verbal forms" which may express them. Weyl has asked whether certain propositions are either true or false. I should suggest that the issue would be properly stated if finitists asked the question: Do these verbal forms have sense? Can one claim meaning in mathematics for verbal forms if one can give no method of exhibiting either their truth or their falsity? The question whether any aspersions are being cast on the tautologous " p or not- p " by the finitist view must be preceded by the question whether the verbal forms at issue are actually values of p and not- p . To contrast their position clearly with that of the logistic school, they ask whether such verbal forms as "Euler's constant is rational" and "Euler's constant is irrational" have "concrete meaning",¹ and by virtue of this are real, and not merely formal, contradictories. If it is not certain that either of the verbal forms constituting the alternative can be affirmed to be true, because there is no method of deciding it other than enumeration of cases, can mathematicians claim that one or other of them is true; that is, are the two forms legitimate values in " p or not- p "? The denial that they are values does not deny the law of excluded mean. One would have to assume that these forms did have the "concrete meaning" the finitists require, in order to derive from the denial that either is true this unsavory consequence for logic.

At least this is the case from the point of view of Weyl, who seems to assume, perhaps questionably, that he is in conformity with usage in limiting the law of excluded mean to forms one of which can be proved "constructively". It can be said in his favour, however, that in common usage the law of excluded mean is applied either (1) to alternatives which can be decided by a finite method—which therefore either through some general demonstration at hand, or because of the certainty that verification or disproof is possible by mere enumeration, have the sort of

¹ R. Wavre, "Logique Formelle et Logique Empiriste". *Rev. de Mét. et de Morale*, Vol. 33 (1926), p. 67.

meaning required, or (2) to alternatives whose alternants are hypotheses for which verification is not expected. However this may be, the law of excluded mean, as Weyl conceives it, is certainly not denied, but merely in certain cases declared inapplicable. I have really taken his view as "the finitist position", though as a matter of fact, Brouwer, who has in our century first forcefully put forward the finitist position, does deny the law of excluded mean. But the way in which he does it is so obscure that I have throughout preferred Weyl's statements to his. There is, according to Brouwer, a third alternative for *propositions*, that of being neither true nor false. And "such is not a subjective state of ignorance but an objective logical fact".¹ The obscurity in this claim for *propositions* is obvious. And so I choose Weyl's less obscure position to serve for the most part as the view to be contrasted with those of logicians and formalists.²

The formalist attack on the finitist position suggests that formalists suppose the verbal forms concerned to differ in no important sense from other verbal forms within mathematics, and therefore that the finitist is questioning one of the fundamental logical canons in questioning alternatives of the form " p or not- p ". If this assumption were granted, the difficulty about the nature of these forms would be postulated away. At this point the finitist mathematician would rightfully feel that the advantages of postulating are, as Russell said, "the same as those of theft over honest toil".³

I think we see that directly or indirectly what is required by the finitists in the examples which were given is certainty of the possibility of converting "there is" into "this is" and forms beginning with "all" (where the subject class is infinite) into statements true on grounds of the axioms or definitions. Weyl has been aware that the crux of the matter is the nature of verbal forms beginning with "all" and "there is", and has formulated a theory of judgment⁴ in which only sentences of the form "This particular element has the property E" express "genuine judgments". Verbal forms beginning with "all" are "incitations to

¹ Errera and Barzin, "Sur la Logique de M. Brouwer", *Bull. de l'Acad. Royale de Belgique. Classe des Sciences*, 1927, p. 59.

² It is perhaps unfair to Brouwer to take literally the statement of his position as bearing on *propositions*. The same claims about verbal forms would be free from the objections just made. At any rate, it is possible that more careful language could obviate these.

³ *Introduction to Mathematical Philosophy* (London, 1919), p. 71.

⁴ "Ueber die neue Grundlagen-Krise der Mathematik", *Math. Zeit.*, Vol. 10 (1921), p. 54.

judgment", "drafts on judgment", which are redeemed by genuine judgments. Translating from Weyl, "Every number has the property E", *e.g.*, 'for every m , $m + 1 = 1 + m$ ', is not a genuine judgment, but a general draft on judgment. If now a single number, *e.g.*, 17, occurs in my course, then I can with it redeem a genuine judgment from this draft, namely, $17 + 1 = 1 + 17$.¹ General judgments differ from existential ones in that the former are the "legal ground" for all singular judgments, while the latter are "abstracts" from genuine judgments and are nothing at all if the genuine judgments from which they should be derived are non-existent.

His reasons, however, for giving general verbal forms a different status from existential ones are I think wrong. Common to both Weyl and Hilbert is the error of analyzing a general form as a conjunction and an existential form as a disjunction, that is, as logical product and logical sum. Wittgenstein has pointed out that there are cases where $(x) . fx$ is a logical product, but these occur only when the subject class can be defined as a list. Any statement about "all primary colours" is an illustration. Here, after enumerating the colours of which the property is asserted, it is not necessary for completion of analysis to add, "And these are all the primary colours". With most general propositions this is not the case. Evidently there is not mutual entailment between "All men in this room have hats" and the assertion " x and y and z have hats".² And when we add to the latter, "And these are all the men in this room", these two propositions together entail the number of men in the room, which our original proposition does not. The connection between a general proposition and a conjunction seems only to be that exhibition of elements of the class with the asserted property confirms the generalization, while a negative instance upsets it. Where the subject class is infinite, only confirmation, as opposed to verification, can be effected. The error of finitists and formalists alike is in making general and existential forms of infinite range equivalent to infinite logical products and sums. Then they point out that "infinite product" and "infinite sum" are meaningless, which they are; but this analysis was unwarranted in the first place. Some of the extremes of the finitists are traceable to this analysis.

We can now sum up the issue between the various schools.

It should be noted that the actual formal negative of "all" is

¹ *Op. cit.*, p. 55.

² Example taken from Dr. L. Wittgenstein's lectures.

"not all". Logicians have brushed aside the question whether the symbols for "not all" and "there exist" shall have precisely the same usage by defining $\overline{(x) \cdot \phi x} = (\exists x) \cdot \bar{\phi}x$ (see *Principia Mathematica*, Vol. I₂, pp. 46, 130). And after having admitted the difficulty which finitists see in this, formalists set up this equivalence as an "axiom definition",¹ with the claim that they can prove by their finite meta-mathematics that this will not lead to contradiction. Hence the difficulty at the back of the question whether the sign $(\exists x) \cdot \bar{\phi}x$ means the same as "not all x have ϕ ", and whether it has meaning at all in these cases, is transformed into the difficulty of proving its use non-contradictory. The attempt, then, of both formalists and logicians is to minimize any differences in usage of $\overline{(x) \cdot \phi x}$, or what comes to the same thing in this controversy, any differences in usage of $(x) \cdot \phi x$ and $(\exists x) \cdot \bar{\phi}x$. This is seemingly done by fiat. But if making a distinction between usages operative within mathematics is seriously considered as an alternative, I should suggest using the symbol $\overline{(x) \cdot \phi x}$ for all cases where a "non-constructive" use of "not all" is involved, and the symbol $(\exists x) \cdot \bar{\phi}x$ for all cases where the "constructive" use is involved ($(x) \cdot \phi x$ in non-constructive proofs involving the negative of $(x) \cdot \phi x$, and $(\exists x) \cdot \bar{\phi}x$ in constructive proofs involving the negative of $(x) \cdot \phi x$). On the face of it, the symbol $\overline{(x) \cdot \phi x}$ does have these two usages. Substituting $(\exists x) \cdot \bar{\phi}x$ for $\overline{(x) \cdot \phi x}$ in those cases where $\overline{(x) \cdot \phi x}$ is the conclusion of a constructive proof, and confining the use of $(x) \cdot \phi x$ to such proofs as *reductio ad absurdum*, we have usages that will allow the entailment $(\exists x) \cdot \bar{\phi}x \rightarrow \overline{(x) \cdot \phi x}$, but not the converse. Further, a proof of $(x) \cdot \phi x$ would prove the contradictoriness of $(x) \cdot \phi x$, while proof of $(\exists x) \cdot \bar{\phi}x$ would provide a contradictory case. The question is whether these obvious differences in usage of $(x) \cdot \phi x$ shall affect the symbolism so that we shall have the separate symbols $(\exists x) \cdot \bar{\phi}x$ and $\overline{(x) \cdot \phi x}$; or whether these differences, on whatever grounds, shall be minimized by the symbolic equivalence set up between them.²

We shall now turn to the objections raised against the finitist position. There are several common ones, most of which can, I think, be met. One, voiced by Ramsey, rests on the assumption that the analysis of general and existential forms into logical

¹ D. Hilbert, "Die Logischen Grundlagen der Mathematik", *Math. Annalen* 88 (1923), p. 157.

² The considerations of this paragraph applying to the symbols $\overline{(x) \cdot \phi x}$ and $(\exists x) \cdot \bar{\phi}x$ apply also to the symbols $\overline{(\exists x) \cdot \bar{\phi}x}$ and $(x) \cdot \phi x$.

products and sums is correct. He writes, "The logical sum of a set of propositions is the proposition that one at least of the set is true, and it is immaterial whether the set is finite or infinite."¹ First of all, in view of the fact that this controversy arises precisely because of the peculiarities of verbal forms of infinite range, it does not seem to be immaterial whether a set is finite or infinite; and secondly, the difficulties cited earlier in connection with the verbal forms at issue cannot casually be dismissed, even though they do not present the added difficulty which Ramsey's analysis erroneously makes. The grounds for this cavalier dismissal of difficulties are expressed in essentially two objections, one that the law of excluded mean is indubitable and the other that a great deal of mathematics would be destroyed by the finitist tenets. As I have tried to indicate, prior to drawing conclusions about how the law of excluded mean would be affected, the question whether the verbal forms are actually values of " p or not- p " must be asked. As for the pragmatic objection, it of course brings no such charge as inconsistency against the proposal to confine the usages of $(x) \cdot \phi x$ and $(\exists x) \cdot \phi x$ in the way which the finitists suggest; but a mounting toll of casualties among formerly respectable proofs does in fact require the finitists to give justifications.

A common objection to the finitist position is that the (supposed) denial of the law of excluded mean projects our ignorance on the facts themselves. The objection suggests holding, in the case of existential verbal forms, that a certain particular mathematical fact exists even though we may never be able to say it does, *e.g.*, holding that there exists a particular number of the form $2^{2^{n+9}} + 1$ which is factorable, without being certain that we can ever say that $2^{2^{10}} + 1$ or $2^{2^{11}} + 1$ or . . . is factorable. The difficulty lies in saying that a mathematical fact exists though perhaps never expressible in language; for the symbolism does not seem to be extraneous to the existence of this sort of fact. It seems somehow essential. To assert that an existential verbal form is true is to claim that a propositional function, " x has the given property", has a value. But what can "having a value" mean in the case where the value may not be expressible? In view of this, the verbal paradox in saying that there neither exists nor does not exist a factorable number of the form $2^{2^{n+8}} + 1$ may seem preferable to holding that one or the other is actually true, although we are ignorant which one.

¹ *Foundations of Mathematics* (London, 1931). Footnote, p. 7.

Another objection raised rests on misinterpretation of the finitists' claims. If misinterpreted in this way, finitist mathematicians appear to be putting a stop to the asking of challenging questions—to be depriving mathematics of a heuristic maxim. First, it is supposed that they are denying that every proposition is either true or false. Critical comments on the supposed denial, if relevant at all, must presuppose that finitists consider themselves to be dealing with *propositions*. And this, on Weyl's presentation of finitism from which I am for the most part drawing, is not done; nor is it a necessary tenet of the finitist view. Questions which finitists raise, however, are often so interpreted as to attribute to them this assumption. For example, Prof. Wavre asks whether an alternative is even posed if there is no means of deciding it,¹ that is, whether a verbal form must be proclaimed to be either true or false when there is no means of demonstrating its truth or its falsity. Lévy, in criticism, makes this equivalent to the question whether one can set a problem without being sure of being able to solve it.² I think Lévy is really assuming throughout his criticism that before solving a problem the verbal forms mean what they do when shown to be true, or to be self-contradictory, as the case may be, and that the only thing necessary is to determine which is true. This assumes the point at issue. If the finitist used my terminology, he would claim that full meaning is something *acquired* by the verbal forms at issue when the form becomes the conclusion of a demonstration, or rather, so soon as it is seen that, by some specific proof of the sort acceptable to the finitists, the form in question results. Now the logician criticizes the finitist as though the latter, in saying that until then such verbal forms lacked sense, had put a check on future progress—as though the denial that verbal forms always expressed either a truth or a falsity left no reason for considering them further. And the formalist, while ignoring considerations of meaning, would in his own way interpret the denial as depriving mathematicians of a heuristic principle—since it is in accordance with the finitist position to hold that in advance of demonstration the “formulæ” of formalist mathematics which come in question neither are nor are not deducible. And Hilbert's axiom of the solvability of every problem seems to come to the assertion that deduction in every case either is or is not possible. As such it supposedly acts as regulative in mathematics. But I see no

¹ R. Wavre, “Sur le Principe du Tiers Exclu”, *Rev. de Mét. et de Morale*, Vol. 33, p. 428.

² Paul Lévy, “Critique de la Logique Empirique”, *Rev. de Mét. et de Morale*, Vol. 33, p. 547.

reason why, instead of asking, "Which of these propositions is true?" or "Which of these formulæ is deducible?", one might not ask, "Can one of these forms be given concrete meaning?". And the latter is as much an incitation to further probing—is of as much heuristic value, as the former. There is no suggestion that more ingenuity will be of no avail.

I should like to consider now certain extremes of the finitists which have brought upon their view the charge of incomprehensibility. I cite the following treatment of an assertion about integers as an instance of an extreme which has really no place among the examples I have previously given as illustrative of their position. Weyl says,¹ in connection with the assertion, "All numbers are even", that it has no meaning to negate this proposition, since the negation is equivalent to an infinite logical sum. Ignoring the erroneous mention of a logical sum, let us suppose that what he meant to say was that this statement, like "All numbers of the form $2^{2^n+9} + 1$ are factorable", has a negation which may never be verified. But is this at all the case? I think it is evident that we can make immediate verification of "There exists an odd number". And this at once places it in a different category from a statement which has yet to acquire a concrete meaning and may never do so. The two general propositions and their negations differ radically, and I believe that ignoring this difference has resulted in the extreme cited. Moreover, "All numbers are even" and "All numbers of the form $2^{2^n+9} + 1$ are factorable" not only differ because disproof in the first case is immediate. Granting the second verbal form were disproved, it would only be so by a stroke of luck. And it is not luck that disproves "All numbers are even". The disproof has to do with what Wittgenstein calls the grammar of the statement. If the property "even" could be asserted of every number, the assertion that this property held would be true by definition. Such properties have been called "inductive".² It is obvious from the way the natural numbers are generated that evenness is not such a property. To assert that all numbers possess it would be a provable contradiction; that is, this case seems to me not even to call for an exhibition of an odd number to prove its falsity. As Weyl himself says, "General judgments about numbers are not considerations about individual numbers but about the

¹ "Consistency in Mathematics," *Rice Institute Pamphlet*, Vol. 16, no. 4, p. 247.

² Bertrand Russell, *Introduction to Mathematical Philosophy* (London, 1919), pp. 21-22.

essence number",¹ that is, if they are provably legitimate. And if on the basis of axioms and definitions they are provably illegitimate, I should think no disproving instance would be necessary to show them contradictory.

In defence of Weyl's treatment of expressions asserting the attributes "even" and "factorable" as though they were on a level, it might be pointed out that these two attributes are similar in being non-inductive. Obviously "All numbers of the form $2^{2^n+9} + 1$ are factorable" makes no claim that "factorable" is a property of all numbers, but only of such numbers as have a certain other property also. Now suppose that we assume the above statement to be a formal proposition.² That is, let us assume that "factorable" is an internal property of numbers of this form. Is it not then completely on a level with the formal proposition, "All numbers of the form $2n$ are even"? The answer is, of course, "Yes"; but the real point is whether we can legitimately assume it to be a formal proposition, or, for that matter, a self-contradictory one. In the case of the assertion, "All numbers are even", we have two methods at least of disproving it. First we can show that the statement is not a formal one by exhibiting the numbers generated by the operation $+1$ and by giving a constructive account of even numbers as generated from 0 by the operation $+2$. Second, we can exhibit a number which is odd. But in the case of the other verbal form, we have neither a means of showing that "factorable" is or is not bound up with the construction of numbers of the form $2^{2^n+9} + 1$, nor can we be sure of being able to exhibit a prime number disproving it. These differences are I think sufficient to indicate that Weyl ought not to treat "All numbers are even", as he seems to do, after the analogy of the second example. On the other hand, formalists should not treat all existential verbal forms whose negatives have been proved contradictory after the analogy of the formal proposition, "There is an odd number". Unless an existential verbal form can be shown to be a formal proposition, it cannot be treated as one. And proof of the contradictoriness of what is taken as its negative is, as I have tried previously to indicate, no ground for concluding to the truth of the existential conclusion, if truth has anything whatever to do with verification. One can conclude only to a verbal form meaning no more than what the *reductio ad absurdum* proof makes it mean, namely, that

¹ "Ueber die neue Grundlagen-Krise der Mathematik", *Math. Zeit.*, Vol. 10, p. 54.

² One true on grounds of the axioms or definitions.

$(x) . \phi x$ or $(\exists x) . \phi x$ is contradictory, but not to one beginning with "there exists", where the latter fulfills finitist requirements.

Another example of an extreme of the finitists (and really of Hilbert also, who takes essentially the same view as Weyl as to the nature of general and existential propositions), is in the analysis of "There is a prime between 50 and 100". The analysis is I think gratuitously objectionable. To quote from Ramsey's exposition, "'There is a prime which is greater than 50 and less than 100' . . . appears to contain a part '51 is a prime, or 52 is a prime, etc. *ad infinitum*' and so to be an infinite logical sum, which, like an infinite algebraic sum, is first of all meaningless . . ." ¹ Ignoring the analysis into a logical sum, the interpretation Ramsey gives is, "There is one out of the infinity of primes which is greater than 50 and less than 100", an interpretation which the finitists would find *prima facie* objectionable. But I see no reason why it should not be interpreted, "There is within the finite class of natural numbers between 50 and 100 one which is prime". A mere rewording thus makes the existential assertion unobjectionable, and furthermore, as I see it, correctly interpreted.

¹ *Op. cit.*, p. 70.

(To be concluded.)

V.—DISCUSSIONS.

ARE ALL MEN MORTAL ?

I MUST begin this Paper with an apology. It is not intended to announce the ripe fruits of a life-long research into the Elixir of Life, nor even to be a profound disquisition on eschatology. Its aim is much humbler. It really aims at nothing more than an adequate discussion of one small point of logic, nay, of formal logic.

Nor will it demand any recondite knowledge from its readers in order that they may follow its argument : it will suffice if they can recall the familiar syllogism by which logicians have endeavoured for over 2000 years to demonstrate at one stroke the value of Syllogism and the mortality of man. I will assume only that we have all been brought up to believe that if it is true that

All men are mortal,

and that *Socrates is a man*, it necessarily follows that

∴ Socrates is mortal.

Have we not all, moreover, tacitly taken to heart the grievous fate of Socrates, and applied it to ourselves ? Do we not all believe that in virtue of this syllogism we too shall die ? Do we not all admit that it provides conclusive and coercive proof of the mortality not only of Socrates, but of every other man ?

Furthermore, we are assured by all exact logicians—and do not nowadays at least 75 per cent. of logicians claim to be ‘exact’ ?—that the above syllogism is a ‘*valid*’ argument, and that its truth is undeniable. So there seems to be no hope for us to escape from the grip of a logic as inexorable as death itself.

Such, then, is the tradition I wish to call in question. I wish to show, not for the first time, that, as commonly interpreted, it is invalid in form and fallacious in prophecy ; while as for ‘exactness,’ good heavens ! if this syllogism illustrates what exactness means, let me thank my stars that I dare not claim to be an exact logician !

My criticism may fitly begin with a brief recapitulation of some ancient objections which have been urged against this model syllogism. Soon after it was promulgated, it was noticed that this ‘*valid syllogism*’ appeared to be an illustration rather of a notorious ‘*fallacy*,’ namely of the fallacy of begging the question. For was not the truth of the major premiss dependent on that of the conclusion ? Could *all* men be mortal unless Socrates was, too ? For was he

not a member of that doomed assembly? Unless the formal and exact logician *knows*, for sure, that Socrates is mortal, he has no right to affirm that all men are mortal. His alleged proof of Socrates' mortality, which he reaches so triumphantly in his conclusion, has covertly begged it in the major premiss.

The formal logician, however, is not daunted. He would scorn to surrender to so obvious an objection. He has thoughtfully secreted one or two more trumps, which he proceeds to play.

So he repudiates the suggestion that the major premiss of a syllogism is to be interpreted as a summary of facts and observations. It is intended as a *definition*, and an (otherwise) man-like creature that is *not* mortal, is no 'man'. But alas, if that be so, why then is not the point said to be proved now begged in the *minor* premiss, when Socrates is called a 'man' and it is assumed that he is a man in the sense required by the definition of man as mortal?

Even so, however, formal logicians still have a third line of defence, on which they can, and do, fall back. There is a third interpretation of the syllogism which, they are confident, will make it sound and valid. The major premiss should be taken, neither as a definition, nor as an exhaustive and therefore impossible enumeration of particular cases, but as a connexion of universals or as the statement of a law of nature. Take it thus, and the immutable order and stability of nature will safeguard the conclusion.

Candidly, I must confess that this contention seems to me no better than the others. It is here assumed that the magic word 'universal' avails to put to flight the critic, and that no one will dare to ask just *how* the universal mortality of man assures the demise of Thomas, Richard, and Henry.

If, however, I can be protected from assassination till I have finished my argument, I will pry further into this assumption. May I humbly inquire why the logician feels so certain that every particular is *nothing but* a case of any 'universal' any one chooses to inflict upon it, and why he may presume that, because his classification seems to fit in some respect or for some purpose (which we may charitably suppose him to have investigated), it therefore applies in all respects and for all purposes (which he cannot even have imagined exhaustively)? The logician doubtless can impose any universal he desires; but cannot the wretched particular resist and rebel against the imposition? Surely every particular is fully concrete; it may exemplify an indefinite number of universals in a variety of contexts, and yet these may all leave its individuality unexhausted and intact. Also for one human purpose one universal may be better than another; one may fit and be right, another wrong. As Alfred Sidgwick says, for some purposes a thermos-flask may be a hot water bottle!

How then will it be possible to prove that what is a case of a certain universal for one purpose *must* also be a case thereof for another? And how, may I ask, is it proved that every particular

which for a certain purpose may be taken as a case of a certain universal, must *ipso facto* function also as a case thereof for all other purposes? Why should every case of any universal exhibit all the qualities of that universal? May there not be exceptional cases to which under the special circumstances the normal rule does not apply? And may not the case we are interested in prove in some respects exceptional? How can we know *a priori* that when we try to prove Socrates mortal by means of his general conformity to the habits of the human kind, we have not hit upon a quality in which he happens to be exceptional?

So on this third construction also our syllogism would seem to beg the question. It assumes, but does not prove, that our case, Socrates, to wit, cannot be recalcitrant to the habits of humanity (as known up to date). It argues that

All human nature (including Socrates) is mortal.
Socrates is human.

∴ *Socrates is mortal.*

Now the contention that Socrates cannot do anything exceptional, because in a general way he is a man, cannot at any rate appeal to the authority of the author of our argument, Aristotle. For (as I ventured to point out in MIND, No. 89) Aristotle realised in his own fashion that, in our sublunary world at any rate, exceptions might occur to all rules, thanks to the prevalence of contingency and the possibility of 'accidents'. Thus rules were general, but not necessarily universal. He was willing therefore to admit that something might be true in general, and yet false in this special case, or for a special purpose. It could not therefore be asserted *a priori* that a particular case would come under the general rule. If the syllogism assumed that it must, it begged the question, or ignored the special circumstances of the case.

Plainly, then, it will not do to set aside the protests of Tithonus, Enoch, Elijah, the Wandering Jew, and so forth, in short of the whole band of heroes who have claimed exemption from the 'law' of the mortality of man.

If we desire really to defend the syllogism and to insist that it must have a sense, and a good one, we must look deeper than these naïve devices of Formal Logic. We must give up the pretension that our reasoning can start from absolutely true premisses, and prove its conclusion absolutely true. We must not sever it from its scientific context in an inquiry in which certainty is an aim, and not a presupposition. A syllogism must be a way of stating a hypothesis and formulating an experiment, of which the issue is as yet in doubt, but may peradventure be observed. If so, the occurrence of the conclusion, as predicted, will confirm our belief in the premisses and will increase their probability, though it will never amount to absolute proof. For it will not be more, logically, than the verification of a hypothesis.

We shall then be able to protest also against the grotesque demand that a decision should be given about the case of 'Socrates' in the abstract and without any context. No one in his senses, we shall say, will argue about 'Socrates,' without knowing what is meant by 'Socrates,' whether a defunct philosopher or a negro slave, a tom-cat or a character in fiction, and without knowing what the problem is that has arisen about him. Give us a real problem and we may be able to give you a real answer, but do not torment us and yourselves with unmeaning forms of words that are hopelessly ambiguous, or rather indeterminate. If and when, therefore, any one has occasion to construct a syllogism about any 'Socrates,' it must be in the context of an actual problem. It must be because a problematic 'Socrates' has turned up and there are doubts about him. He is under grave suspicion. Is he a man or a ghost? Has he died with due decorum, or is he an impostor who has put on a delusive show of having come to life again?

But in all these cases shall we not have to admit that the conclusion of our syllogism is but probable? If, for example, a loquacious and eristic spook claims to be 'Socrates' in very deed, and it is objected to him that he died over 2000 years ago and should stay dead, because all men are mortal, he will have to show that he is not a crafty medium in diaphanous disguise, but is psychologically continuous with the personage whom the enraged Athenians overdosed with hemlock about 2333 years ago. And notoriously the proof of spirit-identity is difficult: it can hardly be absolutely proved, and until it is, the conclusion *Socrates is mortal* remains disputed and in doubt.

Nay, it remains in several sorts of doubt. For in our haste to hail the argument as valid and coercive we have quite neglected to inquire what exactly may be the meaning of its terms. Does 'man' include 'ghost,' 'spirit,' 'spook,' 'phantom,' 'elemental,' 'hallucination' and 'delusion'? Or does it include them for our purposes? And what does 'mortal' mean? Does it mean 'doomed to die,' 'liable to death,' or simply 'dead'? The use of Socrates as the syllogistic hero strongly speaks in favour of the third suggestion. But how is the fact that Socrates has been dead for 2333 years a proof that all men are doomed to die?

If in the case of Socrates 'mortal' can mean nothing more than 'dead,' has not our major term become ambiguous, and is not our 'valid' syllogism afflicted with four terms? What then becomes of our coercive demonstration of the universal mortality of all men, past, present, and to come?

Yet, plainly, if Socrates is to be our guide, 'mortal' *must* mean *dead*. It cannot mean 'liable to death' or 'doomed to die'. And then, if we interpret consistently, our syllogism runs—

All men are dead.
Socrates is a man.
∴ Socrates is dead.

Here certainly the conclusion seems true ; also the minor premiss, if we are willing to concede that being dead or alive makes no difference to a 'man'. But what about the major premiss ? Surely it will never do to argue to the future death of those now living from the mere deadness of the dead ?

We must therefore try again. Let us send Socrates back to Hades (where he belongs), and select a *living* man, say Mussolini. Can we validly and cogently infer that Mussolini will die some day, because in former days all who have died are now dead ? Mussolini may emulate the mighty dead in this matter also ; but I fail to detect any logical or biological necessity in the argument that professes to compel him. Why should he imitate the dead, rather than the living ? Why should he not initiate a new departure in biology as in politics ? Why should not some Fascistic professor of physiology succeed in discovering some drug or mode of life that would extend indefinitely the organism's power to repair itself, and so to stave off death ? And why should not Mussolini profit by this discovery ?

Moreover, if this discovery were made, what would happen to the traditional mortality of men and to the presumable meaning of 'mortal' ? Clearly, it will no longer be able to mean 'doomed to die' : for it will no longer be inevitable that all must die. It will therefore be expedient, nay imperative, to reduce the meaning of 'mortal' to 'liable to death' ; for man will still be capable of dying, and will not yet be 'immortal'.

But what will then have happened to our syllogism ? It will fail as an instrument of prediction, and will no longer be able to give us the assurance of Mussolini's death. For it will run

All men are liable to death.

Mussolini is a man.

∴ *Mussolini may die*—but who can tell ?

We are now getting very near to what I suspect to be the true inwardness of Formal Logic. It loves the syllogism, and has clung to it through good report and ill, because it has conceived it as a great instrument of prediction *a priori*. It values the mortality of man, not in order to feel assured that Queen Anne is dead, or Socrates, but in order that it may claim to predict the future deaths of all men to all time, and that no science may dare to contradict it. With its aid it seemed possible to burke Hume's inconvenient question : 'Why *should* the future resemble the past' ?

Can this claim be allowed ? It can base itself, of course, on an array of impressive and pretentious principles, such as the Uniformity of Nature, the Laws of Identity and of Contradiction, the Stability of Meanings. But when we look more closely, their support soon begins to totter. There is no 'valid proof of Induction', simply because induction is always a *risky* process. The Uniformity of Nature is a confused rubbish-heap of principles, of which the most reputable are principles of method ; but it is no protection against

the stream of change. The Laws of Nature are, at most, the habits of things; but cannot all things change their habits if sufficiently provoked? We have, at any rate, no proof that they cannot. The Law of Identity also is no guarantee of immutability: for everything is in continual change in spite of it. It rests with us to declare when a thing has changed so much that really we no longer care (or dare) to identify it with its past: but we are also free to insist that the slightest change shall be considered fatal to its 'identity'. So too we are at liberty to denounce the slightest change as a breach of the Law of Contradiction—because the thing is no longer what it was and has thereby 'contradicted' itself: nevertheless we fight shy of invoking this principle, because we dare not be so grotesquely and impracticably Eleatic as to deny that things can change. All these appeals to principles turn out to be empty threats that can get no purchase on the course of nature.

Verbalism also will not save us. For though we can, of course, proclaim that words shall not change their meanings, we cannot but admit that they have more important functions to perform than just to keep their meanings stable. How, for example, shall we enable them to transmit the *new* meanings necessitated by the growth of knowledge and the progress of invention? We can, no doubt, enact a law that men shall 'ride' only on animals, on horseback, on a mule, on an elephant, or even in extreme and disastrous cases, if a foolish virgin, like Europa or the young lady of Riga, on a bull or a tiger: but what then are we to do on a bicycle, in a train, or in a car? Again, when the physicist discovers whole realms of entities within the compass of his former ultimate, the 'atom,' how can he be compelled either to devise a wholly novel set of terms, or to retain the indivisibility he had so rashly postulated?

The truth is that it is neither practicable nor good sense to endeavour to arrest the natural growth of meanings which attends the growth of knowledge: if our control over nature changes, so must the language which describes it. It is vain, therefore, to decree that 'mortal' shall retain its former meaning, even though the facts which it was intended to describe have radically changed. We must let our words develop with our knowledge and our power.

We cannot therefore base genuine and fruitful predictions on the present meanings of our words. For we cannot foresee what changes they may not have to undergo. In a world which is plainly capable of novelty and change there is no absolute proof, no absolute certainty of inference, and no complete scientific answer to Hume's searching question. Or rather, our answer cannot be more than methodological. We assume *faute de mieux* that Nature is 'uniform,' because it is the simplest of the assumptions we can start with, and enough, initially, to guide inquiry: but as we painfully discover the inaccuracy of our assumption, we gradually correct our formulas, until they work sufficiently. Our whole procedure is essentially empirical, and the pretensions of the Formal logician to foresee the

future, and to predict it without fail, by 'analysing' the present meaning of our words, is fantastic and absurd. It is 'wishful thinking' which measures nothing but the height of his presumption and the depth of his ignorance and conceit.

Let us therefore be more humble. Let us honestly confess that we do not know whether all men will always need to be described as 'mortal,' and that at any rate no such conclusion can be validly elicited from Formal Logic.

F. C. S. SCHILLER.

ARTISTIC FORM AND THE UNCONSCIOUS.

In the interesting Symposium,¹ 'Artistic Form and the Unconscious', read at the Joint Session of the Aristotelian Society and the Mind Association at Cardiff last July, it was inevitable that Psycho-Analysis, which defines itself as the science of the Unconscious, should come into the field of discussion. As is its wont elsewhere, however, psycho-analysis troubled even the serene atmosphere of philosophical discourse, nor were the misunderstandings absent that are familiar enough in less exalted spheres. Lest they take root in what should be an uncongenial soil for confusion of thought, I venture to offer a few comments on some of the statements made on that occasion.

Mr. Thorburn stirred the trouble by taking as an example of a psycho-analytic study of artistic creation my development² of Freud's explanation of the well-known Hamlet problem, in the course of which he made some overkind remarks on my personal contribution. Mr. Hannay expressed the opinion that works of art are not the product of subconscious [*sic*] activity, thus finding himself in disagreement not only with most psychologists who have made any profound study of artistic creation, but also of most creative artists and poets. The only modification he allows is where 'the disclosure (of a complex) either condemns the work of art as abnormal or it shows that the complex was merely an occasion of the work, in the same way as a love affair may be the occasion of a fine novel' (p. 143). For example, 'if the play (*i.e.*, "Hamlet") has, in fact, the theme attributed to it by Ernest Jones, then, as a work of art, it is a failure. That is to say, the analysis will have had a dissolvent effect' (p. 144).

Mr. Hannay's view on the matter may be defined as follows: (1) A 'complex' may actually occur in some people; (2) when it does it is to be regarded as an abnormality which it is desirable to remove; (3) it can be 'dissolved', when it will disappear together with any effects it may have previously been producing; (4) when it has been concerned in the genesis of a work of art it makes no genuine contribution to this and merely impairs it. More than this, however, Mr. Hannay appears to identify this 'complex' with the unconscious mind altogether. In fact, he does not use the term 'unconscious' anywhere in connection with psycho-analysis, replacing

¹ Published in Supplementary Volume XIII, Aristotelian Society.

² Published in book form in German, in 1911, and in English as a chapter in my *Essays in Applied Psycho-Analysis*, in 1923.

it by 'a complex' or 'some Freudian basis', which are evidently the same for him. 'The aim of psycho-analysis is to dissolve the complex. . . . If it were shown that the modern predilection for inflated volumes had some Freudian basis, the predilection would tend to *disappear*,¹ (p. 143).

Mr. Hannay is evidently under the impression that he is criticising the psycho-analytical conception of the unconscious, whereas he is only drawing a very remote caricature of this. The term 'complex', taken from associationist psychology, has found much favour among the public. Psycho-analysts have also at times employed it for certain limited purposes—the term may be found in my 'Hamlet' essay, which was written a quarter of a century ago—but it proved to be of very local value, and also to have various potentialities for misleading, so that it has been almost discarded. I know of no reason why a complex should be regarded as necessarily abnormal, nor can I conceive any way of 'dissolving' it other than a re-arranging of its elements—which is a very different matter from annihilating it and its derivative effects. In any event it is very far from being synonymous with the psycho-analytical conception of an unconscious mind, as I shall presently show. As for the 'aim of psycho-analysis', I should regard this, not as the dissolving of complexes, but as diminishing the tension between conscious and unconscious mental processes; there is no question of abolishing the latter, even if such a thing were in any way possible.

Mr. Leon's apprehension of the unconscious mind studied by psycho-analysts is even more tenuous. He begins with saying that he knows at least ten senses of the 'unconscious', but he forgets to say that they are all invented in an armchair, and have nothing at all to do with the actual unconscious processes that operate in the mind and are the subject of laborious and detailed investigation.

He describes three of his ten. The first is the 'creative spirit itself', to be sharply distinguished from the form or content created. A psychologist would perhaps call it the wish or impulse to create, and would agree that many people, notably young writers, are aware of it in the very way Mr. Leon describes: they wish to write, but do not know what. It is very evidently a conscious mental process, or—in Mr. Leon's language—it '*has consciousness*'. Even more to the point is the fact that it is never to be found among unconscious mental processes, which invariably have both form and content. When we are considering a mental function that '*has consciousness*', one of which the subject is always conscious when it is present, and one which is never to be found in the unconscious mind, it does seem to be importing an unnecessary obscurity to label it as 'one of the senses of the Unconscious'. I can only agree with Mr. Leon when he says that many people do this, though they should not. But, as I have just demonstrated, he is not right when he says that psycho-analysts confound it with their own description of the unconscious.

¹ Here italicised.

The second 'sense of the Unconscious' is the memory of past experiences. 'We may call it the tomb of buried memories, including complexes. It is the "Unconscious" of the psycho-analysts' (p. 155). This very astonishing statement is followed by this one: 'Psycho-analysts . . . are fond of rushing in and identifying the first with the second "Unconscious"'. They identify, that is, the womb with the tomb, invention with memory'. These confused people then proceed to apply to intense activity, *e.g.*, poetic creation, an explanation which holds good only of passive phantasy or insanity, 'of the straying, that is, of faded ghosts of experience through a weary, lazy, sleeping, or cracked brain' (p. 155).

Although Mr. Leon uses the expression 'buried memories' in reference to this kind of unconscious, he appears to regard it, like the first one, as really conscious or at least readily accessible to consciousness. 'But be it noted that when the artist (especially the writer) organises some mnemonic residuum he and we become clearly conscious of it. Why then do we need Psycho-Analysis? It is conceivable that the latter is needful for getting at the psychic contents of inarticulate and unintrospective persons. But the writer's (especially a Shakespeare's) business and aptitude lie precisely in exploring every nook and corner of his psyche and in dragging out of it, for trade purposes, whatever he can. Is not then this fad of applying Psycho-analysis to writers and literature a preposterous carrying of coals to Newcastle? We may be sure that . . . if Shakespeare had had an incest-complex we should have known of it long ago, and should not have had to wait three hundred years for the inspired psycho-analyst to come along' (pp. 156-157). But if we are concerned only with processes of which both the writer and his reader are conscious, on what grounds can we describe them as any sort of 'Unconscious'?

Nor does the 'Third sense of the Unconscious' bring us, according to Mr. Leon, any nearer to unconscious mental processes. 'What is often called the "Unconscious" exists in the psyche of a few people only or even *only*¹ in the theory-ridden imagination of the psycho-analyst. The incest-complex is a case in point. . . . There can be no incest-complex except in a few individuals who abnormally have incestuous inclinations. Shakespeare may very well have been one of these rare ones and have concealed the fact from fear of the public. If he was, we can only say "Poor Devil"!' (p. 157). Here, therefore, we have to do with mental processes that exist either in the (conscious) imagination of the psycho-analyst alone, or, possibly and occasionally, in unfortunate victims who are only too aware of their infirmity. So once more we have to do with only conscious mental processes.

Since Mr. Leon, very properly, lays stress on the matter of definition, I will contrast with his 'senses of the Unconscious' a short statement of the chief findings which psycho-analysts designate by

¹ Here italicised.

the term 'unconscious'. The first point that distinguishes them from other connotations of the word in psychology or philosophy is that they refer to mental processes of which the subject is really *unconscious*.¹ He is completely and absolutely unconscious of their possible existence, has not the faintest glimmering of this, and if told of it would be as incredulous as Mr. Hannay and Mr. Leon are of the suggestion that Shakespeare would not have written 'Hamlet' had he not been influenced by an unconscious sexual attachment to his mother.

The next point is that the mental processes found in this unconscious region of the mind, so far from being 'faded ghosts', are much the most active and *dynamic* we have, the very driving force of our personality. Surely it must by now be familiar that modern psychology calls itself 'dynamic psychology' just in so far as it is affected by the emphatic attention psycho-analysts have called to the wishful and striving aspects of human nature—the volitional, creative and dynamic aspects. By unravelling the earliest manifestations of these unconscious urges we are able to relate them to the various innate instincts—fear, sex, aggression, etc.—which supply the source of all vital energy.

I indicated just now that the primary form of the unconscious urges and trends are dissociated from the conscious self: as we term it, they are 'ego-dystonic'. Only derivatives of them, much distorted and modified, can reach consciousness. Consciousness is thus stirred to activity from without, through perception of the outer world, and from within, from the depths of the personality. It follows that in investigating the source of any creative activity—whether 'normal' or 'abnormal' whatever these words may mean—we have essentially to look within the mind; the phrase 'deep inspiration' is a significant one.

Last of all, what is the relation of creative, *e.g.*, artistic, activity to past experiences? Mr. Leon apodictically asserts that 'They (*i.e.*, psycho-analysts) and all reference to their 'Unconscious' must be ruled out of court by *Æsthetic* for the reason that the new, the organising spirit or life, in short, the beauty, of a work of art is *a priori* and can never be explained by the old or the past or the experience or memory whether of the individual or of the race' (p. 156). We are here back at the conception of 'uncaused mentation', one with which no scientific psychology can operate. Actual investigation of the creative impulse, on the contrary, yields ample evidence of its being related to the past. And that in two ways. The activities in question can be shown to be—whatever their *æsthetic* value—simply other forms of *expression* of the same urges as were manifested in 'lower' ways in early life, the re-direction

¹ The English word used in this connection is not a very adequate translation of the German '*unbewusst*', which might be rendered 'unconscious'd' if we had such a verb. It is intended to indicate the subject's unawareness of the mental processes in question.

of them being brought about by the interplay of conflicting intrapsychical forces. Further, although these urges function continuously throughout life, being the essential source of all our mental activity, there is a period of life—namely, infancy—when they can be profoundly modified by the experiences to which the personality is then subject.

If I allow myself for once to be as dictatorial as Mr. Hannay and Mr. Leon, I should assert that to study the genesis of a creative act without taking into account the Unconscious is akin to the familiar enterprise of presenting "Hamlet" without the Prince of Denmark.

ERNEST JONES.

VI.—CRITICAL NOTICES.

Idealism: A Critical Survey. By A. C. EWING, M.A., D.Phil.,
Litt.D. London: Methuen, 1934. Pp. viii, 450. 21s.

IN one respect this is a perfect book. Idealism has a way of rousing scorn in its critics, but in this long critique there is never a gibe, not even an insinuation, nor a single argument that simply scores a point. It contains nothing but reasoning, except here and there a modest expression of personal conviction when scrupulous argumentation has gone as far as it can go or as far as the problem in hand requires it to go. There hangs all over it the atmosphere in which controversy becomes instructive and conversion possible. It is the most fair-minded as well as the most searching critique of certain aspects of British idealism that has been given to us. The chief reason for all this lies, of course, in the author's philosophical and moral integrity, but it is natural also to suppose that his former belief in idealism left him with an inalienable appreciation of its merits. For if his book is a palinode it is also a tribute to what it recants and refutes. Its temper is still the generous temper of idealism. But the genius of the book lies elsewhere, in its form and matter rather than in its atmosphere, in the shape and stuff of its elaborate argumentation. Every problem is analyzed with a remarkable versatility and pertinacity of criticism, which is too discriminating to be merely logically exhaustive; only in the too numerous footnotes—the afterthoughts of a very scrupulous mind—does the sustained anatomisation seem at all final. It is a fine achievement, which should survive the fashions of the day. If there is any defect, it follows from the nature of the procedure, from the author's mastery of it, not from any mishandling of it; for when the pros and cons of a very restricted group of problems are subjected to a minute analysis running through more than four hundred pages, the result is a multitude of relatively independent arguments, eddying round a few centres—there is no linear advance, no general demonstration. This is only an æsthetic criticism which I mention simply in order to hint at the difficulty of writing a review; the difficulty being not merely that any summary of so richly and closely reasoned a work must be miserably bare, but much more that the omission of the detail in which all the merit lies makes fair general comment almost impossible.

The situation that has provoked Dr. Ewing to write his book is

the neglect of idealism in the current philosophical literature and discussions of this country. Indisputably the most influential type of theory in the modern period, idealism deserves to be assessed; and he thinks that we are now far enough from the day of its dominance to be able to make the assessment fairly. This is an implied condemnation of the considerable polemic against idealism which in the name of realism seriously began in the late 'nineties and continued until a few years after the war. Indeed, there is in the book almost as much criticism of this realistic attack as there is of idealism, although the essential rightness of much of it is freely urged. But Dr. Ewing had also in mind a special aspect of the present situation which he, like many others, views with alarm—the emergence in the last few years of so wide a difference in pre-suppositions, terminology and argumentative technique between what might be called the Cambridge school (under the various influence, I presume, of Moore, Johnson and Wittgenstein) and the followers of the classical tradition as formerly represented in Oxford and Scotland, that each side is becoming both unintelligible and utterly irksome to the other. The division roughly, not exactly, corresponds to the division between sympathizers with realism and sympathizers with idealism. In a comparison of the two sides, Dr. Ewing interjects the charming judgment that on the whole the former argues better but the latter reaches wiser conclusions. In this reference, Dr. Ewing's book is an attempt to present an examination of idealism in a form comprehensible to both sides. His qualification for this irenic task is, I imagine, unique, and his accomplishment of the task eminently successful, if I may presume to judge from the fact that I as I read the book am sensible of the foreign quality of its idiom and pattern and yet find it possible to follow it with only occasional difficulty.

The initial problem of a book being the delimitation of its scope, Dr. Ewing begins by laying down the sense which for his present purpose he will attach to the term "idealism". He restricts it to the theory that the existence of physical objects apart from experiencing is logically inconceivable. He prefers to call the type of theory that maintains the cosmic supremacy of spiritual values theism, on the ground that it is represented by thinkers whom no philosopher would call idealists. Anyhow, he is right in declaring that most admitted idealists have used the doctrine of the inconceivability of unexperienced physical objects in the service of their distinctive metaphysics. Now that doctrine may be concluded to on the ground that all known and knowable objects are relative to mind; or from the premiss that the specific character of physical objects entails such relativity; or because it is supposed that physical objects are of the very nature or stuff of mind. The first of these forms is bound up with the theory of the internality of all relations, which in turn connects itself with the coherence theory of truth and reality. All three are often supported by arguments drawn from an

analysis of the process and factors of perception, intended to show that the object is in one way or another integral to the perceptual experience. These, then, are the topics to be examined. Since they are kindred matters and have historically appeared in association with idealism, it would be idle to deny the propriety of treating them together, of treating nothing else, and of calling the treatise a critical survey of idealism. A book that is a book is one that both has homogeneity and respects its limits. Dr. Ewing sensibly precludes an arid academic discussion about his inclusions and exclusions by remarking that it rests with him to choose what topics he shall discuss. His interest in what he does discuss is further restricted to its logical content and bearing: except for a chapter on Kant's theory of knowledge and quite casual allusions, history is left alone. The reviewer is grateful that he has not to rummage in his Berkeley or his Hegel to challenge yet another interpretation of an ambiguous text.

The most sweeping form of epistemological idealism has various ways of expressing itself—subject and object are correlative, the *esse* of all objects is *cognosci*, we can never transcend the world of ideas, and so on. Dr. Ewing exposes certain verbalisms in these and similar formulations but concentrates on the general charge that the contention behind them, logically pressed, involves solipsism. There are thinkers who would deny that this is a charge at all; if it is a necessitated conclusion they are prepared to accept it. Most of us, however, would agree with Dr. Ewing that such a conclusion, far from being proved by its premisses, is a sufficient disproof of them. The grounds of an absurdity are themselves absurd, and it is absurd when a man undertakes to communicate to others the view that only his own experiences exist. Only when solipsism is self-consciously a mere soliloquy is it not absurd. Yet we still have text-books which tell the student that solipsism cannot be disproved. But is Dr. Ewing's charge correct? I see no way of denying it. If all objects, objects *qua* objects, are internal to the experience in which they arise, there can be but one experience, a finite one, the experience of him who makes this declaration. That there can be only one solipsist is an analytic proposition. However, the absurdity has been sufficiently recognised not to need stressing; what does need to be considered is whether the escape, within idealism, commonly made from it can be logically allowed. The escape consists in asserting that the subject to which all objects are correlative is not the finite thinker but an absolute subject, not this or that mind but mind *qua* mind. The book here makes two strong observations; firstly, that if the absolute subject be immanent it knows only through the acts of finite centres, so that by the original contention no object could be separated from any one of these; and secondly, that if the absolute is transcendent, the knowledge of finite centres is left realistic. The first is no escape, for it makes each thinker's world his own world and thus leaves him without right to affirm

the existence of any other world. The second is an escape only if the existence of an absolute mind has been established on other grounds, not merely postulated to get out of the solipsistic difficulty, and even then the objects must be pronounced relative not to the knowing activity of the absolute but, rather vaguely, to its experience, the creation of an object being very distinct from the knowing an object, knowing being always a finding. Against an extreme idealism of the kind mentioned at the beginning of this paragraph, unsupported by non-epistemological grounds, these criticisms appear to be sound, and would, I think, be accepted very generally to-day in this country. Phrases about the essential inseparability of subject and object have ceased to attract us. They are true, but true by definition, and prove nothing outside the reference of the definition. An object *qua* object cannot be separated from some subject; but to treat an object only as an object is to apprehend it simply as apprehended.

But is knowing always a finding? Dr. Ewing regards the idealists' emphasis on the constructive aspect of the total knowing process as a service of considerable value, though he notes the metaphorical character of the notion of construction in this connection. But he refuses to identify the making there undoubtedly is with the knowing. In so far as knowing is equated with awareness (or belief, or judgment in the sense of simple assertion) I see no possibility of denying that awareness (or belief, etc.) is not making but finding. This, however, as he recognizes, is only a matter of terms, for the epistemological idealist could without prejudice to his position re-phrase his dictum and say that all objects are relative to—more specifically, are the products of—a constructive function which can be separated from the apprehending aspect of the knowing process by nothing more than a conceptual line. No one has ever said that the mere being aware of an object is what makes it (Kant makes it clear that the making is a pre-condition of the awareness); the most that has been said is that an object, once made, can be sustained only by awareness. Anyhow, that there is a contributive or constructive activity in the knowing process is indubitable, and Dr. Ewing accuses the realists of not squarely facing it. Still, he proceeds to show that this constructive activity is compatible with a realistic interpretation of the object. The supposition that what the mind makes is purely subjective, and that the subjective artefact is what it in the first instance knows, is dogmatic in both its parts; and the alternative supposition (perhaps the same in a different form) that what the mind makes is theory, that the theory is inextricably mingled with the fact, and that therefore the object is at least phenomenal in the Kantian sense, rests on the unexamined, and when examined dubious, assumption that the laws of theory are different from the laws of fact, Dr. Ewing touches on the ambiguity of "theory" and "fact"; but I wish that he would explore it more fully, for I am sure that under his acute inspection it would become either clearer or more

obscure instead of being, as it is as present, simply and vexatiously vague. The epistemological position as I see it is that the more we reflect both psychologically on the process of knowing and in the Kantian fashion on the logical conditions of knowledge, the more do we need the *notion* of a datum and yet the less do we discover data. But this problem may not be very relevant to the question whether the indisputable fact of mental construction entails the view that all objects whatever are mental. I gather that Dr. Ewing's answer is, firstly, that the notion of construction cannot be said to entail anything until it is stripped of its metaphor and defined, and secondly that it may not be definable as anything more than a condition of objective insight, the struggle of the mind towards the prize of vision.

Since the correlativity of subject and object has sometimes been deduced from or justified by the doctrine that all relations are internal, this doctrine now calls for examination. The discussion is as detailed as it ought to be, is exemplary, and, in view of the rarity of a patient and impartial analysis of this matter, may be regarded as one of the most valuable sections of the book. Dr. Ewing recognizes that there is a deeper problem, namely, whether the category of terms-in-relation is appropriate at all to the interpretation of the real; and so far as the order of primary experience is concerned, which he regards as a continuum, he has some sympathy with Bradley's condemnation of the category. Personally, I am not happy at the contrast of a continuous order of primary experience and a discrete order of concepts; for I can only see it when I interpret the former subjectively, in all the accidents of its psychological context, and the latter objectively, in its logical context only. But Dr. Ewing does recognize that the category of relation is required for the coherence theory, on which he sets a high value. On the internality of all relations he agrees with other realists that if this doctrine implies that the relation of being known introduces in all cases a modification of the thing as known, the absurdity of the conclusion is a sufficient disproof of the premiss. But he sees that the premiss is highly plausible, and plausibility is—if I may venture a definition—either the union of real truth with verbal error or else *vice versa*. He analyzes it with care and skill, distinguishing ten possible meanings of the expression "internally related". Since I cannot give this long list I cannot state his results with any precision. On the one hand he insists that there are no terms possessing a nature logically independent of their relations, and that everything is related to everything else, so that reality has a high degree of unity (though not so high as that to be found in a single substance or a single mind); for (a) causality is universal, and involves logical entailment, (b) relations presuppose a continuum, and (c) it is difficult if not impossible to find a quality which can be described apart from relations. On the other hand, he holds that it does not follow that all relations are constitutive of their terms. Which are and which are not is a matter of particularized inquiry; it being certain that some relations are

internal in a sense useless to the idealist, and some not internal in any sense. For example, a term may be, and probably is, essentially related to all other terms taken together, but not relevantly related to most of them taken singly. This discussion leads Dr. Ewing to the most sensible consideration of the coherence theory I have met. He accepts the theory as an account of the criterion of truth, not of the nature of truth; for truth is a property of judgment, and judgment is different from what is judged, so that here a correspondence (Dr. Ewing prefers to call it "accordance") theory is required, the objections to it being valid only against versions of it that make knowledge of physical things inferential. The author's version of his accordance theory will be found on page 201 *ff.*, and should be read in its context. Of special interest, however, is his apologia for coherence as the criterion of truth: he regards it as counterbalancing the current analytic bias by emphasizing the whole, and providing the logical condition of that synthetic inference which a very active school is at present denying (the logistic school). In its metaphysical aspect—for a criterion of truth involves a view of reality—it is a weapon against the immoderate irrationalism and pluralism which prevail in certain quarters. Despite certain reservations about the theory in its metaphysical reference, Dr. Ewing feels that the present bizarrerie of philosophical programmes warrants the medicine of a return to the coherence theory; and if those thinkers who distrust anything that has in fact been associated with idealism can accept his assurance that the theory has no logical connection with idealism, at any rate in any epistemological form of the latter, but only with a modest but indispensable form of rationalism, the problem of the criterion of truth may soon cease to be a party issue and leave investigation free for the exploration of essential differences between the schools.

The coherence theory is, of course, a feature of post-Kantian idealism. The older idealism—in the sense that covers the Cartesians as well as the British idealists—based itself very largely on a theory of perception. Dr. Ewing moves with the same imperturbable urbanity amid the tantalizing minutiae of this theory. He first clears the ground by proving, to my satisfaction at least, that whatever theory of perception be the right one, any non-realistic one is false to our actual and inescapable perceptual convictions, and he adds that our inability really and consistently to repudiate these convictions is not altogether negligible evidence for them (the argument from commonsense). Still, are they right? All that can be expected is to show that the belief in independent physical objects is the most reasonable hypothesis; and it is such by the antecedent probability given to it by its naturalness and indispensability, and because it alone enables us to make perceptual experience coherent—*e.g.* only by the assumption of external causes is it possible to explain both true and erroneous perceptions (for the only explanations of illusion and hallucination that leave them erroneous

are in terms not only of psychological but also, sometimes exclusively, of physiological and physico-chemical factors realistically conceived), both which are left simply unexplained by agnostic phenomenalism of the subjective kind just as much as by subjectivism in its extreme form. An accessory consideration is that the awareness of a not-self, a something independent of self (which *sensa* are not) is part and parcel of self-awareness, so that if the former is illusory so too is the latter. All this may appear too easy, but I must refer to the mass of supporting detail, which I have to omit. It will naturally be asked: After such a justification of perceptual realism, what is Dr. Ewing's own account of the perceptual situation? What is the relation of *sensa* to physical things, and what properties does he attribute to the latter? With the memory of many exhausting discussions of these points in the newer realism still fresh, I find it a relief to read his direct answer in a few pages, which would bear some extension. Put comprehensively, the answer is that actual *sensa*, being at least functionally dependent on the mind, cannot be or be parts of physical things, but that nevertheless physical things must be conceived in terms of *sensa*, as "unsensed *sensa*", if for no other reason than that in the long run we have nothing but *sensa* to provide either the terms or the evidence. Since the primary and secondary qualities are inseparable in *sensa*, only very strong reasons, not yet forthcoming, could warrant attributing merely the former to physical things: every argument for the realistic interpretation of perception applies to both, except that the independence of the secondaries is not required when the interpretation bases itself solely on the demand for a causal explanation of perceptual experience. For the same reasons, adds Dr. Ewing, sensory beauty should be regarded as physical. *Sensa* as sensed have a grouping and a causal context which are in part mentally determined; as unsensed they have other affiliations, are public, and persistent. The theory, it will be noticed, has to be called a representative one, and precisely for this reason it leaves open the possibility of erroneous perception and even of finding, after further analysis and widened science, that fewer and fewer of the secondary qualities may need to be referred to physical things. But though representative, it does not make of the proximate objects of perceptual awareness a screen fundamentally heterogeneous from the physical things; nor does it make the knowledge of these inferential, for the knowledge is stated to be in fact non-inferential and the justification of it is a justification of its non-inferential character. Perhaps I may put the matter by saying that "what is immediately before the mind in perception" neither means nor can be made to mean "what the mind non-inferentially knows"; sensed *sensa* are the immediate objects, but the knowledge of them as sensed *sensa* is, of course, not perceptual but reflective, and so far indirect. I must ask no one to judge this theory apart from the long process of elimination which has led up to it.

Before leaving his theory of perception Dr. Ewing draws attention

to what he calls a startling corollary of it, namely, that, if true, it shows (a) that mind makes, not indeed physical things, but entities very like them, that is, *sensa* which happen to be sensed, and (b) that this making of *sensa*, and the making of images as well, are a creation *ex nihilo*, for sensed *sensa* and images are not re-arrangements of a pre-existing stuff but materially as well as formally new (which is true of images even in relation to their corresponding *sensa*, for they are not made of these but have only a formal similarity with or reference to them). This corollary is not stressed; it is left with the remark that at best it can only serve as a fragment of auxiliary evidence for an idealism grounded non-epistemologically.

The last chapter transfers the discussion away from epistemology to idealism as a metaphysic. Although it is here that my own interest becomes lively, I must for lack of space pass over it; but I think that Dr. Ewing would himself regard it as an appendix required more by the final curiosity of his readers to know what he thinks about the metaphysical issues than by the terms of the heavy task which he set himself to fulfil. I am obliged to omit also any survey of the chapter on Kant, which, coming from Dr. Ewing, will be turned to for its own sake. What I have said of the remainder is largely expository, for criticism is inept when it concerns detail which cannot be reproduced, and hasty when the detail is so numerous and varied that frequent re-reading is needed for the mastery of it. I can only repeat my unreserved admiration for the perfect temper of the book and the very remarkable analytical skill, balanced by sense and sensibility, of the long and close argumentation; and add my conviction that, since the revival of realism, no one has so thoroughly sifted the main epistemological issues, or so wisely judged them. It will be very odd if the book does not mark a stage in the controversy between realism and idealism.

T. E. JESSOP.

Collected Papers of Charles Sanders Peirce. Edited by CHARLES HARTSHORNE and PAUL WEISS. Vol. V, *Pragmatism and Pragmaticism*. Harvard University Press (London: Oxford University Press), 1934. Pp. 455. \$5.00, 21s.

A COLLECTION of writings by one author, nominally concerned with one philosophical doctrine or method, but stretching over some forty years, must inevitably come before us as a scrap-book in which we cannot expect complete consistency or careful arrangement. The most we can hope for is a view of Peirce's difficulties—his successes and failures—in developing and understanding his own line of thought.

After a short Editorial Note, and a Preface of nine pages, the volume is divided into three chief parts, called Books. Book I consists of a set of seven Lectures on Pragmatism, delivered at

Harvard in 1903. Book II contains a number of published papers, the first three of which are from the *Journal of Speculative Philosophy* in 1868. The Editors tell us that "these show the drift towards pragmatism which characterised Peirce's thought at that date, while the remainder contain the published accounts of pragmatism on the basis of which his theory has hitherto been judged". The fourth and fifth papers were published in *Popular Science Monthly* in 1877 and 1878, and the sixth and seventh in *The Monist* in 1905. Lastly, Book III contains a number of unpublished papers, of dates between 1898 and 1905. The Editorial Note is a great help in finding one's way through these scrappy and discursive writings, and the carefully made Index will also be found useful. The task of making this must have been unusually difficult.

The title of the volume needs a word of explanation, though the distinction between pragmatism and pragmaticism is of no real importance. The origin of the second name is explained in 414.¹ In 1905 Peirce thought, rightly or wrongly, that Schiller and James were only "in generic agreement" with his views, and also that certain literary journals had already begun to misuse the name Pragmatism. He therefore decided to abandon it and to invent a new name "ugly enough to be safe from kidnappers" which should definitely be restricted to mean his own variety of the doctrine and method. It is doubtful whether any such change was either needed or likely to have the desired effect. The new name is surely just as capable of extension or distortion as the old one. And why should anyone desire to have his theory kept unimproved?

In this connexion it will be interesting to enquire what differences there are between pragmatism as Peirce conceived it and pragmaticism as it is now conceived by those of us who have no interest in trying to discredit it. There have been some improvements in logic in the half century since Peirce first began to find his way, and these have given our pragmatists of to-day a wider and firmer foundation for the method. But the general purpose of the method remains exactly as Peirce conceived it; namely that of recognising empty verbiage for what it is, and so of avoiding waste of time in disputing questions before we have got their meaning clear, or even before we have made sure that they have any meaning at all. It is true that Peirce notices on several occasions some differences between his own views and those of James and Schiller. Examination of them shows, however, that these do not really affect the conception of the method itself or of its value. Rather, they are at most differences as to the best expressions for certain logical doctrines that support the method. For example, he quarrels (494) with some of the seven alternative concise explanations—miscalled 'definitions'—of pragmatism which Schiller gives in *Studies in Humanism*, pp. 7-12. Brief aphoristic descriptions of this kind, each selecting a limited aspect, cannot be

¹ The references throughout this notice are to the numbered *paragraphs*, not to the pages.

expected to tell the whole story, especially when they are considered one by one. On another occasion (466) Peirce himself, after objecting to something said by James, admits that he is "inclined to think that the discrepancies reside in other than the pragmatistic elements in our thought". Nowhere does Peirce suggest that any other pragmatist conceives the method otherwise than as a valuable instrument for deflating the windbags of philosophy and for discrediting the kind of controversy which is fated to lead nowhere, owing to lack of agreed meaning in the questions ostensibly discussed.

We are told in the Preface that Peirce was led to his pragmatism through his experience of philosophical discussions carried on for some years at Harvard by a group of young men in the early 'seventies. William James was one of the members of this "Metaphysical Club", along with some other men who were afterwards distinguished in Science, Philosophy, and Law. In the two papers contributed to *Popular Science Monthly* in 1877 and 1878 Peirce tried to sum up the pragmatistic opinions urged by him at these meetings during the previous six years.

Both then and later he found it difficult to put his results into the form of a concise "Maxim of Logic" or "Principle of Speculative Philosophy" (18). Even in the Harvard Lectures in 1903 he is content to begin with "some rough approximation to it". But it seems clear that pragmatism was throughout conceived by Peirce as essentially a *method*,¹ based on logical doctrines, to be used in the interpretation of ambiguous verbal statements. The assumption is made from the first that total absence of meaning in a statement is a possibility against which arguers for or against its 'truth' should always be on guard.

Here we meet with what was at the time a logical novelty though always vaguely familiar to the better kinds of common sense. It is still outside the range of proposition-logic and of any philosophers who assume that a statement made in correct grammatical form and consisting of words 'defined' by the dictionary can only be devoid of meaning when its maker, like Lewis Carroll, intends it to be nonsensical. The method as conceived by Peirce depended on the axiom that *neither truth nor falsity* can be recognised in a statement until all doubts of its intended meaning have been removed. As we should now say, a verbal sentence is not necessarily the same thing as an assertion, but only becomes so after interpretation; and in proportion to the real difficulty of estimating the truth of the intended *assertion* we should first determine what—if anything—is actually asserted.

¹ See especially (464) "Pragmatism is, in itself, no doctrine of metaphysics, no attempt to determine the truth of things. It is merely a method of ascertaining the meanings of hard words and of abstract concepts". This is quoted from the first of the unpublished papers printed in Book III. In 1935 we should rather speak of ascertaining the meanings of given *statements*, so as to avoid confusion with the merely general usage of words as recorded in the dictionary.

An intelligent interest in the methods of scientific enquiry was evidently one of the chief influences determining Peirce's attitude in logic and philosophy. William James¹ notes the similarity between Peirce's habits of thought and those of certain English and Scottish philosophers, especially Shadworth Hodgson, who saw the importance of asking what X is *known as*, in place of the question what X *is*; and that is, of course, involved in all the methods of research. The experimenter always asks himself how X may be *recognised* by means of tests devised to show X in operation. For the pragmatist it is in this light that the vague and barren question what 'Truth' is becomes more fruitful, when we ask how the presence of truth *in an assertion* may be recognised so far as any verification is possible. And Peirce, like the scientific enquirer, does not claim that even our best verification is final. He sees that it always leaves room for the future discovery of latent error in the process.

It follows (553) that 'truth' or 'verification' becomes a meaningless word when applied to anything beyond our present power of recognition; and even that the admission of the possibility of error is (565) an 'essential ingredient' of all the truth we have. Pragmatism would suggest that Truth, regarded as an Entity, is *præter necessitatem*. So long as any truth remains for us unrecognised, this seems to be all that we have a right to say about it. We can, and often do, decline to question a given truth-claim, but that is an act of Will, and therefore not the same as *recognising* its truth. The Will to Believe, advocated by James for use in certain special cases, may or may not be a wise and hopeful procedure, but in the end it is confessedly no more than 'make-believe'.

The modern pragmatist doctrine that the only truth recognisable as such by human beings is truth *for a purpose*—i.e. truth as provisionally indicated by the success of an *inference*—is not quite clearly discernible in this volume. The nearest approach to it that I have been able to find is where (494) Peirce approves of the doctrine "all meaning depends on purpose", his only objection to the phrase being that many people besides professed pragmatists would assent to it. But if the doctrine is true, what does it matter how many other people are wise enough to see it? Peirce's objection savours rather of the personal wish to patent his own special brand of pragmatism—the same motive that led him to change the original name for one that would be "safe from kidnappers". After all, it is the truth of the logical doctrines involved that matters, not the label by which the method or its exponents shall be known.

Purpose is, no doubt, a troublesome word to use in this connection, because 'truth for a purpose' is so easily taken to suggest propaganda purposes, especially by those opponents who are hoping for evidence that pragmatism means believing what we wish to believe. On this account a less misleading phrase might be that the only truth we can recognise as such occurs in particular 'truths' from

¹ *Varieties of Religious Experience*, p. 444.

which inferences can be drawn. In short, all recognisable truth is truth *for inference*. Since there can be no meaning in a verbal statement without reference to some possible inference from it, and since there can be neither truth nor falsity in a meaningless statement, it follows that there can be no recognition of a truth except as valid for such and such inferences.

An important corollary from this doctrine may be seen in its effect on our notion of *degrees* of truth. Here Peirce's interest in the calculus led him to think of probability chiefly as a statistical ratio (21-349-587-590). There is, however, a passage (170) in which he comes near to recognising that the only fruitful interest in the degree of truth in a theory lies in discriminating as well as we can the *particular cases* in which the inferences deducible from it have respectively answered and failed to answer our expectations. The passage runs:—"Induction consists in starting from a theory, deducing from it predictions of phenomena, and observing those phenomena in order to see *how nearly* they agree with the theory". After making these observations there is clearly no need to be content with counting them, like votes in an election. The better lesson to be drawn from them is exactly when and where—and if possible why—we were disappointed. Thus partial truth in a theory is truth for some *purposes* but not for others.

Peirce uses the term 'Abduction' to describe the formation of the hypotheses which Induction attempts to test, and raises the question how it is that truths can be reached in science by a process in which there is no compulsion. The answer he puts forward is (173) that for the purpose of Abduction we have a sort of instinct "not strong enough to be oftener right than wrong, but strong enough not to be overwhelmingly more wrong than right"; i.e., an instinct like what Santayana and others have called Animal Faith.

A point that seems to have been less clear to Peirce than to pragmatists of the present day is that as long as we think of meanings as belonging to concepts, instead of to the statements from which concepts are abstracted, we are strongly tempted to think of mere dictionary meanings. As Schiller notices¹ "concepts live only in judgments. They are not really thought unless they are affirmed or denied". When a statement is found to have a doubtful meaning, it is only the simplest and least interesting doubts that can arise through ignorance of the customary meaning of its *terms*; i.e., the terms abstracted from the intended assertion. The really troublesome ambiguity begins when the critic is fully aware of all that a dictionary can tell him, but sees the need of further specification of meaning before he can take the statement as coming under the Law of Excluded Middle. For such a critic there are various possible interpretations of the statement, and until the speaker declares which

¹ *Formal Logic*, p. 13.

he intends to assert there is not yet a question that can be answered yes or no.

Again pragmatism as now understood need not specially concern itself with the problem, thought important by Peirce, as to the precise connection between belief and action, interesting though this enquiry may be. There are plenty of judgments—*e.g.*, that the diagonal of a square is incommensurable with the side—that we may never have occasion to put into practice, and yet we have no doubts about the *meaning* of the statement expressing them. All that the pragmatist is concerned with is the rule that, where doubts of interpretation *have* arisen, the solution of them lies in asking what kind of verification would be regarded as sufficient. When we find an actual statement ambiguous our trouble may in some simple cases be removed by means of a merely verbal explanation, but since explanatory statements themselves may also need further interpretation it is not until they give a reference to some verifiable facts that the enquiry into meaning reaches its end. It is only a childish enquirer who can be satisfied by the substitution of one unexplained phrase for another.

Peirce is on the whole an elusive writer. His account of the logical doctrines on which the method depends is not as clear and explanatory as it might have been. He rambles among a number of interesting philosophical questions, many of which have only a remote connection with the difficulties of interpreting verbal statements. No doubt in trying to express his maxim and its logical supports he was handicapped by the absence of two improvements in logic which have come into notice since his time: first, avoidance of the confusion caused in many contexts by the ambiguous word 'proposition'—used by him throughout the lectures and papers—and secondly, the view of meaning as belonging to concepts only as part of this or that actual judgment, instead of to concepts viewed as independent entities. Again, his frequent use of new or unusual words is troublesome: such words as *artiad*, *perissid*, *cyclory*, *precide*, *idioscopic*, *cotary*, and others. These make reading difficult, especially when no explanation of them is given in the text.

On the other hand there are few, if any, signs that Peirce had to meet the kind of perplexed and suspicious opposition that our English pragmatists enjoyed in the early years of this century. Apparently, for instance, none of the forensic difficulties that were here raised about the meaning of the words 'practice' or 'practical' were brought forward against him in America; difficulties which depend on the mistake of supposing that the distinction between practice and theory must necessarily be referred to, instead of the distinction between practical and merely wordy interpretation of statements.

In England the most successful efforts of the enemies of the method have been made by means of the false accusation that it tries to base our judgments on our wishes. Even Dean Inge¹

¹ *E.g.*, in *Outspoken Essays*, pp. 154-9.

has been taken in by this error, though not himself responsible for it. Its strength lies in the fact that our wishes often do produce a distorting bias, and that it is less trouble to condemn all kinds of 'bias' indiscriminately than to remember that the previous knowledge which gives the expert his advantage over the tyro is also an effective 'bias' though it does valuable service in the search for truth. Peirce continually makes it clear that he—like science itself—has no patience with any attempt to identify the desirable with the true. Nowhere does he say anything that could be mistaken for this irrational doctrine. Indeed, at the beginning of the Lectures (24) he expressly warns his hearers not to be influenced by any liking they may have for pragmatism. Frequently he shows insight into the difference between raising and begging a question. Again, in the first of his papers in *Popular Science Monthly* (Jan. 1877), on the Fixation of Belief, he distinguishes between belief on authority, belief by 'tenacity' (377), the *a priori* method of belief, and finally belief by the method of science. Of these four he condemns all but the last on the ground that the essence of them is "to think as one is inclined to think" instead of as the facts dictate. And near the end of the volume (598) occurs the passage: "I can excuse a person who has lost a dear companion, and whose reason is in danger of giving way under the grief, for trying on that account to believe in a future life. I can more than excuse him because his usefulness is at stake, although I myself would not adopt a hypothesis, and would not even take it on probation, simply because the idea was pleasing to me. Without judging others I should feel, for my own part, that that would be a crime against the integrity of the reason that God has lent to me".

Lastly, Peirce's attitude towards 'indubitable propositions' is perhaps rather old-fashioned, since he here thinks of a 'proposition' as an indivisible whole; and this need never be true of a statement calling for interpretation. He tells us (509) that though formerly he thought there could be no definite or fixed collection of opinions that are indisputable he now¹ inclines to the view that there is at any rate the possibility of a list so nearly fixed "that for ordinary purposes it may be taken as quite so". If all that he means is that everyone does accept some 'truths' as at present unassailable by himself, or even that at a given time our human powers of doubting are limited, Peirce's view may perhaps itself be taken as indubitable; but is it not also "acritically indubitable" (446) just because it is confessedly vague? What exactly, for instance, are we to group together as 'ordinary purposes'? In 1935, I think, we should be troubled by the various possible meanings of 'doubt' in these contexts. Accustomed as we now are to the undogmatic character of science—to the fact that its truth-claims are essentially no more than requests for reasoned objections to be brought forward if possible—the notion of doubt as something merely destructive of

¹ I.e., about 1905, when he wrote the third of his unpublished papers.

belief has been superseded. It is authority, rather than science, that thinks of doubt as an enemy. Science uses doubt as a means of clarifying our vague beliefs and leading them on to a less insecure position by gradually sifting out of them their power to mislead us when we draw inferences from them on particular occasions. To science whatever is 'known as' true is only what has *not yet* been found to mislead us when we have put it to the test. Thus the distinguishing mark of any 'truth' that is open to our reasoned acceptance is that, for such and such inferential purposes, it has so far shown itself incapable of misleading us. Do we need here to be reminded that however much we may dislike the negative quality of this result, that is not a sound reason for thinking it false?

ALFRED SIDGWICK.

Kant. By A. D. LINDSAY, Master of Balliol College, Oxford.
London: Ernest Benn, Ltd., 1934. Pp. x + 316. 12s. 6d.

THE Master of Balliol, in his long-awaited book now published in the Leaders of Philosophy series, has performed a service for which all students of Kant must be deeply grateful. There has long been a crying need for some work in English which would give to the beginner, and not only to the beginner, a bird's-eye view of the Critical Philosophy; and in its absence too many students find themselves entangled in the details of the three *Critiques*, like men groping their way through a trackless jungle. They will now be able to explore this difficult territory with an adequate map of its main features. In an astonishingly small compass Mr. Lindsay has given us an account, at once sympathetic and critical, of the nature and development of Kant's doctrines. To me at least his work is definitely exciting; and I can only express my admiration for the way in which he attempts to make clear the central principles of a philosophy at once so complex and so revolutionary.

Of the six chapters into which the book is divided, the first gives a short and interesting account of Kant's life and of the influences which made him what he was. The second brings out the continuity of Kant's earlier thinking, and also shows his relation to previous writers, especially to Newton and Leibnitz. The last chapter—if I may make a leap—is stimulating, although somewhat slight, in its view of Kant's subsequent influence in Germany and in England. The main body of the book, and the main contribution to Kantian scholarship, is to be found in chapters iii., iv., and v. These correspond roughly to the three *Critiques*; but Mr. Lindsay is particularly skilful at working Kant's minor writings into a continuously developing exposition of his central doctrines. Here, as throughout, the vision of the whole is kept consistently before the reader, with the result that the parts fall into their proper proportions.

I will not attempt to discuss the exposition of the ethical writings beyond saying that Mr. Lindsay is particularly good in relating Kant's ethics to his epistemology. His treatment of the *Critique of Judgement* brings out the unity and importance of that unduly neglected work in a way which, I think, should be extremely valuable to students. This is followed by a general summary of the Critical Philosophy, in which I must confess I found many difficulties. For example, Mr. Lindsay says ¹ 'The thing in itself is thus in Kant's words a merely limiting concept. This must imply that we can and do come to know reality more and more as it is.' I am aware that other commentators have taken this view; but Mr. Lindsay's reference ² does not support it. What Kant says is that the *concept* of a noumenon is therefore merely a limiting concept; and in the context it seems to me to imply that we cannot come to know reality as it is.

The most important and original part of Mr. Lindsay's work is concerned with the *Critique of Pure Reason*. He does not follow the more extreme doctrines of Vaihinger and Adickes (so widely known in this country through the influence of Professor Kemp Smith) about Kant's method of exposition and devotion to architectonic, although he still allows to them a greater weight than in my opinion they deserve. He does, however, maintain ³ that 'the Kantian student is forced to say sooner or later that, whatever Kant may have said in this or that place, *this* is what he really meant—or to dismiss certain elements in Kant's teaching as pre-critical.' This view is widely accepted at the present time in England, and I will not here venture to criticise it; but it manifestly gives a large opening to subjective criticism or what Mr. Lindsay calls 'judgement'. Such freedom may easily be abused; and although Mr. Lindsay uses it on the whole with discretion, there are times when he seems to me too ready to accept inconsistencies which further reflection might dissolve, and even to get rather far away, as he himself admits, ⁴ from anything which Kant actually said. On the other hand, he is always trying to see Kant's philosophy from inside, and to think it through as a coherent whole. In so doing, he brings out many points which are often overlooked or misunderstood. He is always conscious of the reality of Kant's problems, and enables us to see that the solutions are much nearer to common sense than is ordinarily supposed.

Mr. Lindsay insists throughout that the ordinary controversies about realism and idealism are irrelevant, so far as Kant is concerned. ⁵ This, I think, is supported by Kant's own claim that he is both a transcendental (or formal) idealist and an empirical realist. He is the latter, not only because he regards all appearances as appearances of things-in-themselves, but also because he holds that if they are to be appearances of objects, they must be considered *both* as modifications of the mind *and* as states of permanent phenomenal substances

¹ p. 284.² A255 = B310-11.³ p. 39.⁴ p. 117.⁵ p. 56.

in space. And Mr. Lindsay maintains,¹ I believe correctly, that for Kant the 'refutation of idealism' is fundamental.

In this connexion he brings out clearly how Kant refuses to regard what we know as either produced entirely by the mind or produced entirely by objects.² In the first case knowledge would be archetypal, and in the second ectypal. Kant's transcendental idealism seeks to find a middle way between these extremes; and I am particularly grateful to Mr. Lindsay for insisting that it is only the general or universal form which, according to Kant, is imposed by the mind on what is given to sense.³ To imagine that the mind imposes anything beyond the categories and the forms of intuition is completely to distort the Critical doctrine. Mr. Lindsay does full justice to the empirical side of Kant's philosophy, which, as he claims, attached immense importance to the 'empirical form and structure in the given'.⁴

Along with this goes the view that, contrary to the ordinary belief, the psychological atomism of Hume plays no part in the *Critique*.⁵ I believe this to be true, and the limits of space are no doubt the reason why it receives perhaps less argument than it requires for its support. I am obliged to Mr. Lindsay for recalling⁶ to my mind the note⁷ in which Kant definitely says that we can intuit an indeterminate quantum as a whole without a successive synthesis of its parts; but this is difficult to reconcile with the usual doctrine that we cannot represent a line, however short, without drawing it in thought.⁸ Perhaps Kant is distinguishing between an indeterminate and a determinate quantum, between perception and measurement.

Another aspect of this view is that space and time, however much they may have their origin in our sensibility, are definitely on the side of the *given*.⁹ Still more important is the continued insistence,¹⁰ sometimes I think unnecessarily apologetic, on the distinction between intuition and understanding, and the necessity of both for knowledge: to give this up is to destroy the very foundations of the Critical Philosophy. I believe Mr. Lindsay to be also sound in his view that for Kant knowledge is always a process in time, and so must involve synthesis.¹¹ He thus rejects the view of Vaihinger (which seems to me utterly un-Kantian) that the transcendental synthesis is timeless or noumenal; and he is equally clear that the *a priori* has nothing to do with temporal priority.

On all these points and many others Mr. Lindsay seems to me to make a real advance in the interpretation of Kant. As is perhaps inevitable in so difficult a subject, I must also admit that I find in his book a number of theories which I am unable to follow, and in some cases would maintain to be definitely mistaken.

¹ p. 53.

² p. 52.

³ pp. 65, 66, 105, 114.

⁴ p. 65.

⁵ pp. 64-5, 98, 105.

⁶ pp. 145-6.

⁷ A428 = B456. This note, incidentally, is not only in the second edition, as Mr. Lindsay says.

⁸ A162 = B203.

⁹ p. 67.

¹⁰ pp. 66, 79, 93, 107, 108.

¹¹ pp. 55, 64.

In places he seems to me to take too hurried a view of Kant's statements, and to found on this a charge of inconsistency. Thus he attributes¹ to Kant the statement that 'our intuition of external phenomena is mediate, our intuition of time immediate'.² He urges against this that time and space are both forms of intuition and both immediate; and even attributes to Kant 'Locke's muddle at its worst', the view that we perceive our inner temporal modifications and infer from these to external, *i.e.*, spatial, phenomena. Such a view is utterly opposed to Kant's doctrine, and if put forward should rest on an exact quotation of his words. Yet what Kant says is that 'time is the immediate condition of inner appearances, and thus also the mediate condition of outer appearances'. This is a very different statement from the one attributed to him. I do not profess to be able to find my way satisfactorily through Kant's doctrine of inner sense, but he seems to me to be suggesting here that we have immediate intuition only of the time at which appearances are given to us (or are inner appearances); we have thus immediate intuition of the time at which outer appearances are given to us, and by this means we can determine the temporal position of such outer appearances in the objective world. This seems to me to be true, and to be the central doctrine of the Analogies; but whether I am right or wrong in my interpretation, Mr. Lindsay seems to be attributing to Kant an absolutely fundamental inconsistency on inadequate grounds. This is particularly serious, because it affects his treatment of inner sense throughout.

The chief difficulty of the *Critique* is to be found in the Metaphysical and Transcendental Deductions, and at the present stage of Kantian scholarship it is perhaps asking too much of any expositor that he should make them wholly intelligible. While I find much in Mr. Lindsay's exposition that is stimulating and suggestive, I cannot think that he has succeeded in this well-nigh impossible task. Some of my difficulties may be due to my own deficiencies and prejudices, and they may vanish on further reading; but as at present advised, I fail to acquire conviction from his argument, and I seem to find in it errors both in those parts where he follows the current tradition and in those parts where he strikes out new and independent lines for himself.

My difficulties begin with his account of the difference between analytic and synthetic judgements. In spite of the fact that he avoids what I consider to be the worst of the misconceptions prevalent at the present time, he regards the distinction between analytic and synthetic judgements as one commonly accepted by previous philosophers, and thinks that Kant merely made the discovery that synthetic judgements could be *a priori*.³ Kant himself always claims

¹ p. 75.

² The reference is to A34 = B50. Mr. Lindsay's references here are inexact, but I think I am right about the passage to which he refers.

³ p. 59 ff.

that the distinction itself was a discovery; and the evidence of his loose jottings shows that it was one which he made comparatively late. Mr. Lindsay maintains also that Kant's account of synthetic *a posteriori* judgements in the Introduction is inconsistent with his later views.¹ I can see no such inconsistency other than the fact that what is there said requires an amplification, which it later receives. Furthermore, he speaks as if analytic judgements were made by an analysis of the subject,² whereas Kant, at least when he is speaking carefully, always regards analytic judgements as made by analysis of the subject-concept. It is all-important to bring out this distinction, because judgements made by analysis of the subject—that is, of the object to which the subject-concept refers—are not analytic judgements in the technical sense. Failure to recognise this has led to many strange doctrines about Kant. Even Mr. Lindsay, I think, falls into some confusion in this matter, and he fails to see clearly that Kant regards analysis of the subject (but not of the subject-concept) as present in judgement as such, and indeed in conception as such.

This has serious results when we come to the Metaphysical Deduction. Thus Kant asserts that concepts rest on functions, and that by 'function' is meant the unity of the act of bringing different representations under a common representation.³ Mr. Lindsay takes this act as an act of synthesis.⁴ It seems to me to be the act of analysis by which Kant always insists that concepts are made. The function in question gives analytic unity to the different ideas (or objects) in a judgement; and Kant has to argue later⁵ that the same function gives synthetic unity to the different ideas in an intuition. It is on this distinction that the whole Metaphysical Deduction turns.

Through what appears to me to be his failure to grasp this crucial doctrine, Mr. Lindsay finds, as do many others, that Kant's distinction between general and transcendental logic is confusing.⁶ What is much more serious, he is compelled to set aside the Metaphysical Deduction altogether, and to maintain that Kant has to make a fresh start when he comes to the Schematism of the Categories.⁷ To maintain this is, I believe, to break the back-bone of Kant's argument. I am not arguing that Kant's derivation of the categories is correct, but I think that whatever be the errors of his presuppositions, his argument is a coherent and developing whole, and that if we accept the Metaphysical Deduction, the chapter on the schematism is absolutely necessary. If we set aside the Metaphysical Deduction, much of Kant's theory becomes unintelligible.

I will not attempt to follow Mr. Lindsay in his exposition of the Transcendental Deduction as set forth in the second edition. In it I find a great deal with which I agree, but I cannot help thinking that his exposition is detrimentally affected by a failure to grasp at least

¹ p. 60.² p. 57.³ A68 = B93.⁴ p. 84.⁵ A79 = B104-5.⁶ p. 81.⁷ pp. 86, 121, 286.

the plausibility of the Metaphysical Deduction; and he seems to me, perhaps for this reason, to stray in places rather far from Kant's own views. In his interesting example of the books I cannot see his justification for treating empirical apperception as he does,¹ nor for his suggestion—if this is what he means—that transcendental imagination comes in only when we go beyond empirical apperception.² And it seems to me he goes definitely wrong when he attributes to Kant the doctrine that we can only know by acting.³

I have dwelt, perhaps a little ungraciously, on some of the points with which I disagree, and I have no doubt that on most of them the Master is more likely to find support than I. These problems are of such difficulty that the most valuable account is likely to contain errors and certain to arouse controversy. I can only hope that such criticisms as I have made will not obscure the fact that his book is essential, not only to all students, but to all Kantian scholars. In my opinion it marks a great advance in Kantian studies, and I hope in the future to learn still more from it than I have yet been able to do in the time at my disposal.

H. J. PATON.

Philosophical Studies. By A. E. TAYLOR. London: Macmillan & Co., 1934. Pp. vii, 422. 15s. net.

As is very widely known, Mr. Taylor combines profound and accurate scholarship with exceptional literary skill. He has the art of imparting his own irrepressible zest to his many readers, and can persuade them all that any problem that has taken hold of him is of moment for them. This collection of essays, therefore, conveys a wide benefit, and it is pleasant to have all the essays together. Certainly they deal with varied topics. The historical essays, which form the bulk of the volume, are mostly concerned with Greek philosophy, but include discussions of Aquinas, Bacon, Butler and Hume; and two of the essays are ostensibly non-historical. On the other hand, there is definite continuity. Mr. Taylor's excursions into Greek philosophy nearly always provide him with the occasion for comparing old views with new. Again, his essay on Proclus unites Hellenism with scholasticism. The sequence from Aquinas through the half-mediaeval Bacon to the eighteenth-century Hume is too obvious to be missed; and the ostensibly non-historical essays are excellent examples of the way in which classical and scholastic theses may provide the basis for a new and modern rendering that, even controversially, is thoroughly up to date.

Nevertheless, many of the essays are highly specialised discussions of very special themes, and many readers of MIND may desire information regarding Mr. Taylor's particular contentions instead of an

¹ pp. 99-100.

² p. 103.

³ p. 113.

account of his general attitude. With some compunction, therefore, I propose to give a brief indication of the purport of the several essays, and to allow myself a few comments. In doing so, I should like to remark that I think it would be impracticable to attempt to mention all Mr. Taylor's major contentions; that, *more suo*, his incidental explanations are illuminating as well as fascinating; and that, when my comments are objections, I have stated them only because it is easier to object than to say "ditto" or "bravo" all the time.

Of the essays on Greek philosophy, the first, on Æschines of Sphectus, finds confirmation for the historical accuracy of Plato's account of the life and teaching of Socrates in what remains of the dialogues of Æschines, and offers very interesting conjectures regarding the relation of Socrates both to the Periclean circle and to Alcibiades. The second essay, on Parmenides, Zeno and Socrates contends that the *Parmenides* must be supposed to give a belated and approximate account of an actual meeting of Socrates (when a youth of 20) with these celebrated elders, and infers that Socrates, at that early date, had evolved a theory of Forms that evoked Eleatic criticism. (One may wonder, perhaps, how far Socrates developed his early theory during the remaining fifty years of his life.) The greater part of the essay is devoted to a full and very important analysis of the differences between the various arguments loosely described as the "third man". The third and most elaborate of all the essays, that on Forms and Numbers, abounds in points of current as well as of historical mathematical interest, but has as its principal theme the precise reasons why Plato was dissatisfied with the Pythagorean view that the "matter" of numbers was the *ἀπειρον*, and substituted the "great and small". According to Mr. Taylor, Plato attempted a vast generalisation from the geometrical construction according to which the successive convergents to $\sqrt{2}$ were alternately greater and smaller, although the excess and the defect progressively diminished, since he supposed that the cube and other powers might be treated in the same way, and dreamed in error that the integers themselves might be derived by such a method (thereby confusing the number 1 with the indefinite article in logic, and the number 2 with the simplest form of the logical "any"). The fourth essay, on Proclus, as I have said, supplies a valuable link between Hellenism, mediævalism, and "modern" philosophy, by showing the form in which certain neo-Platonic views concerning the One, causality, progression and inversion (or reflexion) persisted in European thought. The fifth essay argues that the passage in Plato's seventh epistle concerning the impossibility of teaching philosophy adequately without prolonged personal acquaintance between teacher and pupil, is characteristically Platonic and probably genuine, despite the opinion of a scholar like Ritter who, accepting the rest of the epistle as Plato's, rejects this passage.

The sixth and seventh essays, on the philosophies of Aquinas and

of Francis Bacon, are perhaps of more general interest than any others in the volume. That on Aquinas is a vigorous and eloquent defence of the Angelical Doctor's originality as well as of his critical flair for reality. St. Thomas's metaphysics, despite its debt to the new scientific horizon disclosed by the rediscovery of Aristotle's *Physics* and *Metaphysics*, was (Mr. Taylor holds) no sort of slavish acceptance of "the philosopher" but, on the contrary, "a masterly synthesis of both Plato and Aristotle with one another and with Augustine, effected by original insight of the first order" (p. 247). Mr. Taylor concedes that Thomas's Aristotelianism loomed larger in psychology and epistemology, but opines that, even there, Thomas was the subtler and the better deserving of modern study. The essay on Bacon (the British Academy oration on the tercentenary of Bacon's death) admits indebtedness (somewhat over-generously) to Messrs. Levi and Whitehead, and holds that Bacon's "forms" were meant to be a genuine alphabet of Nature, and were fundamentally kinematical patterns. Therefore Bacon was "the first of the moderns" and not "the last and most eloquent of the men of the Renaissance". On the other hand, Bacon perceived, as most of the moderns did not, that kinematical patterns can never suffice for philosophical explanation, and consequently maintained the reality of a submental "perception", more subtle than sense, and also of a "kind of election". The essay concludes with a critical account of the logic of the *Novum Organum*.

The eighth essay, on Butler's ethics, argues oddly, as it seems to me; since it tries to prove that Butler was a great moralist, in every relevant sense, on the ground that his *Sermons* were adapted to their immediate purpose and were entitled to assume what their hearers might be expected to accept. Moreover, this London audience appears to have been in a very peculiar frame of mind, for we are told on page 308 that very few of them were "rational egoists" (i.e., a sort of Hobbists) and also, on page 322 n., that they "regarded 'self love' as the one rational rule of conduct".

Naturally Mr. Taylor also contends that it is possible to see from the *Sermons* and *Dissertation* that Butler had excogitated the outlines of an ethical system that should impress a universal audience, and could readily withstand the usual criticisms that are brought against him. The two lines of argument, however, seem to blend in a peculiarly puzzling way. Mr. Taylor, for example, may be right in arguing that the variations in conscience are less serious than many modern moralists and anthropologists suppose. Surely, however, Butler's concession that there is "the appearance of some small diversity amongst mankind" in matters of conscience, is thoroughly inadequate, whether or not his audience would have accepted it. Again, Mr. Taylor asserts that Butler's "let it be allowed" that virtue could not be justified if (*per impossibile*) it were contrary to self-interest, is spoken in irony to a Hobbist audience. But why? From passages quoted by Mr. Taylor himself it appears (a) that Butler set

out to make all possible concessions to self-love and yet to prove it, rightly understood, to be on the side of virtue ; (b) that he *knew*, or thought he knew (possibly on grounds of revelation) that duty and interest did coincide ; (c) that he *knew*, or thought he knew, that prudence was a virtue, authoritative and obligatory. Why then should he not argue, without any irony "Have it your own way. Virtue will come out on top whether you argue from the general obligation of morality, or from the specific moral obligation of prudence, or from intelligent self-interest, so near and dear to all of us. If things were not what they are, and duty and self-interest might differ, any kind of nonsense could be suggested. But things are what they are" ?

In the ninth essay, on David Hume and the Miraculous, Mr. Taylor effectively exposes Hume's equivocation between a miracle, in the sense of an extraordinary event, and a miracle, in the sense of the interposition of divine or invisible agency in the ordinary course of nature. He also criticises Hume's curious logic according to which any evidence for the miraculous is rejected in advance on the ground that miracles are opposed to all evidence. Mr. Taylor's further critical argument, however, seems to me to suffer from a serious omission. Hume's doctrine of "sensitive" belief (in the senses, memory and causal inference) was an attempt to show that a certain type of non-rational belief was satisfactory to men of sense, and included Newtonian science as well as the science of man (*i.e.*, the results of Hume's experimental inquiry into the passions and other features of human nature). Such sciences would be wrapped in obscurity if they were mistaken for ultimate rationalistic metaphysic ; but they did and should satisfy sensible men.

Hence in the *Treatise* (*e.g.*, Sections 9 and 13 of Part III., Book I.) Hume tried to discriminate between, on the one hand, the sort of "inference" (by causal association) that satisfied sensible men, and, on the other hand, mere caprice and prejudice (*e.g.*, most instances of belief arising from association by contiguity or by resemblance). It may well be true that Hume did not succeed, and even that he did not perceive that his principles forbade success. Mr. Taylor, however, ignores his entire attempt, saying that for Hume causes could be "nothing but prejudices without logical value" (p. 348) and that Hume, by holding all events to be loose and separate "excluded all inference" (p. 336).

Mr. Taylor further argues (correctly) that if most human as well as physical science is, in the end, non-rational there is, so far, no good reason to taunt the Christian religion with being non-rational. It is therefore a delicate question how far Hume was serious in his references to the perpetual miracle of Christian faith ; but we need not assume that he did not discriminate between superstition and good sense in this matter also, or suppose that his personal friendship with "moderate" Edinburgh divines has much to do with the affair. No doubt Mr. Taylor is right in saying that a theistic view of the

world might make a great difference to our disposition to affirm "miracles" to be credible, but he himself would admit that it might dispose us to accept rather too many of them, and I do not see that he gives any good reason for believing that the deity is likely to mingle prodigies with the *cursus ordinarius* of nature in order to show forth a sign. Again, when Mr. Taylor says that the Resurrection was an effectively miraculous sign precisely because Christ was the only human being raised from the dead, he seems to forget that the Scriptures clearly assert that both Lazarus and the Shunamite woman's son were also raised from the dead.

The tenth essay on Knowing and Believing, after denying that knowing could possibly be a species of belief, assurance or judgment, seems principally (but by no means exclusively) concerned to assert that knowing is vision. According to Mr. Taylor, such "vision" (which is also knowledge) at one end of the scale must include sense (despite Aristotle) although sense acquaints us with brute fact only. For sense is immediate, there being "nothing whatever intermediate in the order of apprehension between percipient and perceptum" (p. 386). The same immediacy (combined, however, with obviousness) is found at the other end of the scale in complete intellectual vision where there is also said to be a "complete and intimate interpenetration and possession by the knower of the object known" (p. 387). These statements, however, are not supported by a very full explanation, and are reached by a perplexing route. It is explained that knowledge cannot be identical with demonstration, since first principles must be known non-demonstratively, but it is not clear how that circumstance ought to prepare us for the discovery that in *scientia visionis* "the antithesis between immediate and mediated would be done away with" (p. 394). I must also confess to a good deal of uneasiness regarding Mr. Taylor's account of historical knowledge.

The last essay, on the question "Is goodness a quality?" is part of a symposium, and would be easier to follow were the reader acquainted with the precise views of the other symposiasts. It develops the doctrine that goodness, although the assertion of it may be based upon a complex of characteristics, is itself neither a character nor a concept. Goodness, according to Mr. Taylor, is the fact that a substance tends to be what it ought to be, that is to say "tends to a certain completion or fulfilment", that is to say (in the case of communicated being, for the doctrine does not apply to God who *is* His goodness) actualises its "real possibility" (or one of its real possibilities?). So stated the doctrine resembles the morality of the good egg actualising the real possibility of being a chicken instead of the accidental possibility of being scrambled. In any case it requires a lot of metaphysics, and appears to be combined with the doctrine that "evil as such is formlessness".

JOHN LAIRD.

VII.—NEW BOOKS.

Nature, Man and God. Being the Gifford Lectures delivered in the University of Glasgow in the Academical Years 1932-1933 and 1933-1934 by WILLIAM TEMPLE, Archbishop of York. London: Macmillan & Co., Ltd., 1934. Pp. xxxii + 530. 18s.

In the Preface to his Gifford Lectures the Archbishop of York repudiates for himself the philosophical method of deduction from "certainties" in favour of 'the coherent articulation of experience through adherence to certain principles'. His main interests being religious and his convictions being, as he admits, for the most part arrived at subconsciously, the outcome is more a defence of a personal faith than a philosophy; for 'actuality' and 'principles' tend to be assumed rather than exposed to criticism. One may, for example, regret that the Archbishop has so defined the actuality, religion, as to exclude the religions of the Way which do not need, as his does, a Creator or dependence on a Supreme Reality or Will. Christianity itself may be in the early stages of a slow transition from the one type of religion to the other. In the same second lecture which contains his definition of religion he practically assumes, in spite of passages admitting that it is the function of philosophy to criticise religion, that religion and philosophy are not only independent activities but co-ordinate and independent ways to knowledge; the result being that he can describe their relation as one of tension, and avoid fully recognising, what the right to criticism implies, namely, that the final judgement on the truth of beliefs, religious or other, belongs exclusively to the philosopher.

The Archbishop's book is, naturally, of considerable length but its aim can be expressed briefly. He wishes to establish that minds plainly occur in a world which is independent of them and existed before they did, but that a world in which minds occur is only explicable by the category of purpose, which is in any case the only satisfactory principle of explanation, and that consequently a personal Mind is required upon Whom both the world and the minds it contains depend for their existence.

For the realist part of his contention the Archbishop chiefly relies upon two arguments. Firstly, "that the principle 'cogito ergo sum' has a merely psychological cogency because it is impossible to think without thinking of something". "The subjective function of thought can be properly and usefully distinguished from every object of thought taken separately; but it cannot be isolated from all objects of thought whatsoever without ceasing to exist. And it is on the possibility of such isolation that Descartes' argument turns." Secondly, "the world which we apprehend is apprehended as having been extant historically before anyone apprehended it. So far as our experience is concerned apprehension takes place within the world not the world within apprehension."

In support of his first argument the Archbishop cites von Hügel: "We

thus take for granted as rock-certain what is demonstrably non-existent: 'I think' instead of 'I think such and such realities, or at least I think such and such objects'". But the qualification in the last clause destroys the Archbishop's argument and, perhaps, von Hügel's own. It becomes a mere assertion of the intentional character of consciousness which an idealist or even a solipsist could cheerfully accept.

The Archbishop's second argument, and a good deal else in his lectures in this connection, is an appeal to history; but is it not a confusion of issues to suppose that the contention that minds as subjects assign to themselves as objects a place in history, apprehending themselves erroneously or inadequately, can be met by an appeal to that history? This is not the occasion for comment upon the possibility or otherwise of a thorough-going philosophy of process. It is enough to say that the considerable space that the Archbishop gives to the idea of process does not suffice to show, even if it can be said to aim at showing, that such a philosophy would not entail as radical modification in conceptions to which he is attached as in those of Descartes which he dislikes.

To realism and process the Archbishop adds a distinct strain of idealism; for he accepts the principles that the mind's apprehension is apprehension of itself and that totality is the standard of truth and, somewhat surprisingly, of beauty also.

The first of these contentions the Archbishop reaches by means of a series of assertions which he appears to regard as equivalent or nearly so. Minds, he tells us, must be equal to what they know. "The mind of the astronomer is equal to as much of the stellar system as he grasps." In the sequel it does not always appear to be remembered that at best this only establishes a relation to known reality, which may be any fraction however small of the existent. Next we are told of 'the kinship between mind and reality', also described as 'correspondence', which then becomes, "the discovery or recognition by Mind of itself in its object". For all this the Archbishop's chief reason is that a good many poets and artists have believed it; though whether they believed that they were apprehending their own minds, or other people's, or some Mind different from either, is not clear. Possibly they did not believe, any more than does the Archbishop, that they were apprehending minds or Mind, but only, in general, objects which owe their origin to mind without being themselves mental. This readiness to find a mental ground for the universe almost without further inquiry partly depends, however, on the fact that the Archbishop conceives himself to have already established the unique explanatory force of the category of purpose, because, as he holds, other types of explanation leave it still open to us to ask Why? but purpose does not. That this superiority may be illusory because inexplicabilities are merely being transferred from the term 'world' to the term 'purposer-purposes', or for some other reason, is not noticed; in any case one misses the recognition that so controversial an issue can hardly be settled in a sentence or two.

A finalistic philosophy has its own difficulties with the ideal of freedom. The Archbishop holds that physical indeterminism, if it exists, is quite devoid of religious interest, and that indeterminism in relation to human conduct would be merely chance. All determinism presupposes diversity, but the particular diversity which distinguishes human beings and is, he holds, the ground of their freedom, lies in their capacity to be determined by "free" ideas, that is, universals, and, in particular, by the idea of the good. The Archbishop sometimes writes as if this meant an actual

determination by the future, not merely by beliefs or wishes about the future, in opposition to causal determination by the past. Later, it appears that will is a gradual achievement, the integration of the whole personality, and freedom is now taken to be a matter of degree. "True spiritual freedom would be the state of a man who, knowing an ideal which completely satisfied all aspects of his nature always in fact conformed to it and could perfectly trust himself so to do". The Archbishop does not call attention to the fact that this is quite a different definition of freedom from that with which he began, nor to the fact that the consequent "non posse peccare" would make Satan, in whose existence he has the courage to believe, either entirely sinless or at worst possessed of more true spiritual freedom than any human being.

An essential condition of blame appears to be secured by the statement: "The self brings some contribution of its own to the sum total of existence". But when the Archbishop comes to deal with Grace and Freedom, this assertion, though verbally repeated, is in substance withdrawn; as, it would seem, it must be in any philosophy for which creation of minds is a literal truth. The Archbishop at any rate does not shrink from the consequences of his finalism. "There is no faith," he quotes from Dr. Oman, "without in the end ascribing everything to God." And he himself adds: "All is of God; the only thing of my very own which I can contribute to my redemption is the sin from which I need to be redeemed". How such a mere lack, or fragment, of being can sin is not discussed. On the contrary the Archbishop boldly winds up with: "We are clay in the hands of the Potter," thus finally asserting that view of men as things, which he emphatically repudiated when facing naturalistic determinism.

In truth the Archbishop only thinks easily within the familiar circle, power worship—the higher is the stronger—reality is value—optimism—creationism—finalism—amoralism (in the above sense)—acosmism; the last of course unrecognised. For him these ideas are not hypotheses to be questioned or discarded but possessions to be defended at all costs.

It would, however, be unfair to conclude this notice without saying that those who share the Archbishop's preconceptions will find in his Gifford Lectures much that is interesting and even impressive; a picture of the world as it appears to a man of wide experience for whom all things are but a veil through which shines the brightness of his God.

E. W. EDWARDS.

Leben und Erkennen. By GUSTAV WOLFF. München: Reinhardt, 1933. Pp. 442. RM. 11.50.

Der Weg zum Sinn des Seins. By F. M. HÖCHSMANN. Wien: Seidel & Sohn, 1933. Pp. 268. M. 4.80.

BOTH these books are written from the point of view of teleological biology. The former, by Prof. Wolff, is an application of the biological principles in which he believes to the problems of knowledge, and the latter is an application of much the same principles to the problems of conduct.

In the sub-title of his book, Prof. Wolff indicates that it is meant to serve as a preliminary study of biological philosophy; it is in fact intended to teach biologists what they ought to know when they enter the philosophical lists. The result is that the book is long, and at times long-winded.

The first thirteen chapters consist of a defence of the teleological point

of view. Purposiveness, says Prof. Wolff, is what distinguishes the processes that go on in living organisms from inorganic occurrences, but this way of looking at things does not imply conscious purpose; we have to interpret such processes 'as though' an intelligent purpose were at work. Unfortunately there is no discussion about the implications of teleology, and so we are left in the dark as to what exactly Prof. Wolff means. Of course he is perfectly clear on the surface, and there is no doubt that the vocabulary of teleology fits in with every-day language, but what we want to know is: What is the nature of the psychoid something? He certainly does not mean us to think that the teleological interpretation is merely a convenient way of grouping biological material; he declares that there must be something really characteristic of living organisms which differentiates them from the rest of the objects in the universe. Equally certain is it that the minds of human beings are to be regarded as instruments, purposively developed as aids to the fulfilment of the purposes of human organisms; they are not identical with the body, and mental events are not mere epiphenomena; we are as active in knowing and doing as we feel ourselves to be, so that here, at any rate, there is something more than physical processes; but that something itself is moved by purposive forces, and only serves to make such purposes conscious, and to help towards their achievement.

When he speaks of the minute alterations which, in the course of generations, led up to the binocular apparatus developed for animals to see with, we are not told exactly how this purposiveness is to be conceived. The chain of physical events, which have led to such a result, has presumably obeyed the 'laws of matter'; at what point then has anything over and above these rules come in to give direction to the series? This is a fundamental question for biology, and in a book like the one we are considering we have a right to expect a clear statement. All we are told is that: "den teleologischen Tatbestand als Produkt einer seelischen Ursache aufzufassen, dazu fehlt jede wissenschaftliche Berechtigung. Über das Kantsche 'Als Ob' können wir nicht hinauskommen."

The most interesting chapters of the earlier part of the book are those in which the author discusses the evolutionary hypotheses of Darwin, Lamarck, and Geoffroy Saint-Hilaire.

In the next three chapters we have an excursion into psychology, and a criticism of Driesch's 'Methodical Solipsism'. The purpose of these chapters is to establish the reality and efficacy of mental events. A mere analysis of what 'I consciously have' leads to a divorce of experience from reality and to scepticism. What we consciously have must, Prof. Wolff insists, be in some way related to the real world in which we have it.

Thus he passes on to the main purpose of the book—the question of the validity of knowledge. He discusses the views of Windelband, Husserl, Lotze and Bolzano and concludes that the complaints against bringing psychology and biology into the rarefied atmosphere of logical problems are unfounded. We have to psychologise to discover that we reason in accordance with logical rules, and only the principle of biological purposiveness will give us any justification for believing that the rules are not merely psychological peculiarities, but accord with the nature of reality. Our reasons, he argues, have been developed to help us cope more efficiently with the outside world, and therefore they must be in accord with the basic pattern of existence. All other justifications are based on subjective feelings of necessity, which can be no criterion; only the principle of purposive adaptation can make it plausible that the shape of an

instrument developed for the purpose of adapting will fit the shape of the environment to which it is to adapt.

The book concludes with two chapters in which these biological considerations are applied to ethics in the usual way—the 'ought' of ethics is the 'ought' of teleology.

It is this point that Herr Höchsmann elaborates in his book on the meaning of existence.

While admitting that existence may have no meaning at all, he suggests that it is at least as plausible to suppose that it has, and that, if it has a meaning, that meaning may be discovered by scientific observation of the universe. We cannot, he says, apprehend the ultimate meaning of existence, but by studying our own portion of the universe we can attain to an approximate conception of ultimate purpose.

His theory is that the inorganic world was meant as a basis for life, and that living organisms exhibit in their development four great purposes: the preservation of the individual, the preservation of the species, the development of the best-adapted, and the development of consciousness and knowledge, which leads to the grand aim of "Geistige Weltdurchdringung".

Each of these purposive urges is superior in value to the one preceding it, so that, while the highest aim we can apprehend is based on the preservation of individuals and species, yet in an important sense, individuals *quâ* individuals are unimportant.

What is meant by 'Geistige Weltdurchdringung' is not altogether clear, but it means something like conscious control of inorganic and organic environment. It certainly does not mean the detachment of the mind from the world, it is the opposite of the oriental aim, it rather envisages the penetration of the world by mind.

The author applies his conception of the purpose of existence to ethics, politics, science, and art. The application is thoroughly common-sensical. We ought to live in accord with the fundamental purposes of Nature, and if we do not, we are doomed to destruction. All 'otherworldliness' is dismissed as phantasy, and the question: 'Is it good that we should fit in with the purposes of Nature?' is, naturally enough, not asked.

The interesting element in the book is this introduction of a super-personal aim—the development of consciousness and the saturation of matter with conscious purpose by learning how to control it. This is a suggestive idea, but it is inadequately developed. At times we get the impression that mere knowledge and mere control are the highest ends we can conceive of. True, the author insists that we only approximate to the real purpose of existence, but, even so, not everyone will feel satisfied with the identification of ethics and world-purpose as he describes it. He opens a scientific door for the ethical respectability of selflessness, and those men who have sacrificed personal advancement in order to further 'Geistige Weltdurchdringung' are judged the most honourable; but there are many who will feel that knowledge about, and control of, matter, even if they are spread over the entire universe, are vulgar acquisitions, unless used as means to alter other kinds of human experience. It might be, for example, that our conquest of the air is valuable because it has shortened the distance between London and Lhassa, rather than because we have, in some sense, impressed our minds upon the clouds. Even if, as Herr Höchsmann says, our lives are intolerable if we believe that they are meaningless, they might be worse if we find ourselves to be the instruments in the unfolding of a purpose of which we do not approve.

W. J. H. SPROTT.

Nature and Life. By A. N. WHITEHEAD. University Press, Cambridge, 1934. Pp. 96. 3s. 6d.

Is Life a (subordinate and meaningless) aspect of Nature, or is the concept of Nature in all its forms made by Life and for Life, to enable it to live more amply and harmoniously? That is the real, and only important, question at issue between metaphysical Realism and Idealism, though academic wrangling and wrongheadedness usually contrive to obscure it. Realism, better called naturalism, omits the half of the whole which 'transcends' Nature, i.e., purposiveness, the union of body and soul, immediate experience (which as Prof. Whitehead recognises, p. 85, in a sense puts the world in the soul), the identity and continuity of personality, and tries (vainly) to ignore their existence. Idealism, better called humanism, insists that the concept of Nature is derivative from our experience of life, and is essentially, like all our other concepts, an instrumental device, which should keep in mind the abstractions out of which it is constructed and the purposes they are meant to fulfil, but generally forgets them. Its weakness has usually been that it has taken a haughty *a priori* road and refused to trouble itself with the empirical details of the living process of which the knowing process forms a part. Dualism, better called muddled-headedness, has struggled vainly to bring together the two sides of an antithesis expressly constructed to fall apart.

Such, essentially, are the issues which Prof. Whitehead discusses magisterially in this little volume, which embodies two, at least semi-popular, lectures delivered in Chicago University in October, 1933. He shows, very prettily, how the commonsense notion of reality, as it existed at the beginning of the sixteenth century, was ruined by the growth of physics during the next three centuries, as Hume was the first to perceive. But the Newtonian scheme was itself ruined in the twentieth century by the subsequent discoveries of physics. The result is "to reduce modern physics to a sort of mystic chant over an unintelligible universe," comparable to the reports of Babylonian astrologers to Mesopotamian Kings (p. 27). For in present day physics "fragments of the Newtonian concepts are stubbornly retained" (*Ibid.*). Prof. Whitehead, however, proposes to make a clean sweep. He takes the laws of Nature as "merely all-pervading patterns of behaviour" (p. 42) and repudiates their eternity (pp. 37-8). Aristotelian logic he describes as a "disease of philosophy in its itch to express itself in the forms 'some *S* is *P* or all *S* is *P*'" (p. 39). "The fundamental concepts are activity and process" (p. 35), and they are the "primary types in terms of which the process of the universe is to be understood" (p. 43).

But how is a content to be infused into the bare notion of activity? Life and Nature must be *fused* together (pp. 57, 92). Nature must admit of "occasions of experience" and "individual self-enjoyment of a process of appropriation" (p. 59). For "it is nonsense to conceive Nature as a static fact, even for an instant devoid of duration." There is no Nature apart from transition, and there is no transition apart from temporal duration. This is the reason why the notion of an instant of time, conceived as a primary simple fact, is nonsense (pp. 60-1). Nay more, "creative activity" belongs to the essence of each occasion. Also an "aim", to select "from the boundless wealth of alternatives", and to obtain "the enjoyment belonging to the process" (p. 62). But science hitherto "can find no individual enjoyment in Nature; science can find no aim in Nature; science can find no creativity in Nature; it finds mere rules of

succession. These negations . . . are inherent in its methodology. The reason for this blindness of physical science lies in the fact that such science only deals with half the evidence provided by human experience" (p. 66). "Yet it is untrue that the general observation of mankind, in which sense-perception is only one factor, discloses no aim. The exact contrary is the case. All explanations of the sociological functionings of mankind, include 'aim' as an essential factor" (pp. 68-69). "We are *directly* conscious of our purposes as directive of our actions" (p. 69).

As a *method* this abstraction from purpose is, of course, permissible (p. 70); but it is dangerous for philosophy (p. 72). And there is no warrant for separating mentality from nature, and soul from body (pp. 70, 76 f.). In short the "key notion" from which the construction of a "systematic metaphysical cosmology should start is that the energeticity considered in physics is the emotional intensity entertained in life" (p. 96).

Clearly Prof. Whitehead has improved the occasion to tell the scientists what he thinks of them, and it is to be hoped that they will take his lesson to heart. The affinity between his doctrine and that of M. Bergson *saute aux yeux*. Yet his doctrine does not wholly satisfy. It may look ungracious to ask for more when he has given so much, but one cannot but raise the question whether Prof. Whitehead's account of the relation of philosophy to the sciences does not require a further simplification. The more the special sciences are given a free hand and permitted to make methodologically whatever assumptions seem to them suitable, the less likely is it that their deliverances will agree: the greater therefore the need for a philosophic synthesis and reinterpretation. And the more we pluck up our courage to protest against scientific abstractions, the better right we shall have to recognise, in philosophy, human experience as it actually is. Now it actually is *personal*; why then should not philosophy recognise personality, even though the sciences continue to seem to abstract from it? If the philosophic problem were only stated in its full concreteness, everyone would see the need for a logic that did not taboo the notion of purpose, and for a theory of knowledge that frankly treated all our concepts (that of Nature included!) as instrumental to the enrichment of human life. And then it would not long continue to be necessary to admit with Prof. Whitehead (p. 96) that "Philosophy begins in wonder. And, at the end, when philosophic thought has done its best, the wonder remains." It would be seen that between the beginning and the end of the process the *locus* of the wonder is shifted. In the beginning the philosophers wonder at the world; in the end the world wonders at the philosophers and their perversity in closing their eyes to the plainest facts!

F. C. S. SCHILLER.

Idealismus. Jahrbuch für Idealistische Philosophie. Edited by Prof. ERNST HARMS. Rascher & Cie, Zurich, 1934. Pp. 280.

THE function which this year-book is designed to fulfil, namely, a philosophical consideration of the non-physical elements in reality and a reviving of interest in the philosophies of the nineteenth century which have paid most attention to these, I regard as of the greatest value, especially at the present time, and I heartily congratulate Prof. Harms on having made the venture. "Idealism" is conceived so widely that it would be misleading to describe this as the periodical of a particular school. In fact, while

cautiously declining to give a definition of idealism, the editor wishes to include under the term all philosophies which are "non-materialist" and "non-relativist" (p. 6). Possibly the distinctive character of the year-book may be found more in the problems with which it deals than in the actual views professed, and English readers will note that the most familiar name among the year's contributors is that of Prof. Laird, one of our leading realists. One reason for welcoming the year-book heartily, in these times above all, is that it is international.

It contains, besides articles and reviews, outline sketches of the philosophies of three recent thinkers—Dilthey, Bradley and Ravaisson; also a summary of the literature relating to Schelling and Hegel which should be very useful to anyone wishing to pursue research on these philosophers. Similar accounts will be given of other thinkers in subsequent numbers. The articles constitute symposia on subjects selected by the editor, but the latter did not think it desirable in any way to restrict the scope of each writer, beyond fixing a very general title for the symposium, and the individual contributions of the symposiasts are not intended to have any reference to each other. The articles are printed in English, German or French, according to the language of the author.

While some of the articles are very able, and almost all contain very interesting suggestions, I must confess to a certain feeling of disappointment when I compare the actual performance with the very high standard which should reasonably be expected in what claims to be the only periodical representative of such a great movement as idealism in its widest sense. We may hope, however, that this is only an unfortunate accident, and that later numbers will show a great improvement. For it is after all possible for the year-book to draw on the best philosophical talent of all nations, and it may be merely that this time many of the contributors unluckily happened to be below their best form. But I cannot myself see how most of the articles in this number could possibly influence anybody who was not already convinced of the substantial truth of their respective theses before reading them. Some of them, especially those by Losskij and Sganzi, seem to me to mingle mysticism in the bad sense of the term with philosophy, and almost all suffer from vagueness. This is particularly the case with the symposium on "Das Absolute". None of the symposiasts consider it necessary to make clear what they mean by "absolute" at the start and keep to one meaning, and consequently the term is used in about half-a-dozen different senses, and it looks as if the argument really depended entirely on these and similar ambiguities. I do not believe that it really does so, but if it does not it should at least have been stated so as to make tolerably clear what its real basis was. My criticism may seem harsh, and I have not space to work it out in detail, but I insist on these points just because I think on the one hand that it is of the utmost importance that the sides of experience emphasised in the great idealist philosophies of the past should not be neglected and, on the other, that it will be completely impossible for the "idealist" to fight an effective battle for his cause unless he adopts as high a standard of precision in the use of terms as that of his best opponents. He can only hope to beat his realist critics if he appreciates the contribution they have made to clarity of thought and then proceeds to fight them with their own weapons.

While I think myself that almost all the articles printed suffer, in at least a milder form, from lack of precision in terminology, they certainly share this fault with a multitude of past philosophers universally accounted great, and they are most of them at least very interesting and suggestive.

The symposium on "Der Geist" and the articles by Prof. Laird on "The Embodied Self" and by Prof. Jessop on "Being and Reality" deserve the attention of all philosophers.

A. C. EWING.

The Philosophy of John Dewey: A Critical Analysis. By W. T. FELDMAN. Baltimore, The Johns Hopkins Press, 1934. Pp. vii + 127. \$1.75.

JOHN DEWEY is a difficult writer who has written extensively and effectively on a great variety of topics. Hence an elucidation and condensation of his philosophy is a real desideratum. But it seems doubtful whether Dr. Feldman has provided such a royal road to Dewey. His book, a Ph.D. dissertation written under the (very recognizable) auspices of Prof. A. O. Lovejoy, is well above the level of such productions, and affords evidence, not only of faithful discipularity but also of conscientious documentation and diligent 'research'. But somehow the result is disappointing. He has not succeeded in making Dewey easier, in placing him in his historic background, with the right perspective and values. The reason probably is that he has been more eager to criticize than to understand and to expound; his criticisms moreover are launched from too narrow a basis, while his rather patronizing tone may infuriate many of Dewey's followers.

Furthermore, Dr. Feldman has not arranged his material in the most natural order, as is sufficiently indicated by the fact that he discusses Dewey's logic only in his penultimate chapter and then under the caption "Influence of Educational Theory upon Dewey's Philosophy". Logic, however (in the wider sense) forms the basis of Dewey's philosophy and the core of his method. His critic, on the other hand, is a metaphysician, first, foremost, and nearly all the time, who devoutly believes that whoever condemns metaphysics "implicitly condemns at the same time all science" (p. 9), and is always trying to score points on behalf of 'critical realism'. Nevertheless, he nowhere says how he conceives the relation of metaphysics to the other sciences, nor attempts to prove that metaphysics has the same meaning for Dewey as for him. His favourite method of criticism is to make distinctions and to find 'inconsistencies'; it has not occurred to him that *all* terms are (potentially) ambiguous, and that no method is more dangerous than that of making distinctions in the abstract and at random without reference to the purpose and context of an actual argument; hence most of the inconsistencies he finds in Dewey are merely misconceptions of his own.

To illustrate these strictures, which may sound more severe than they are intended to be, I will take only one palmary case, Dr. Feldman's attempt to show that intelligence cannot be *both* a creative novelty *and* an instrument of survival. He begins by declaring (p. 37) that Dewey's is "the most thoroughgoing application of the Darwinian hypothesis to epistemology"; he then goes on to argue (p. 115) that because intelligence has "developed as an aid to biological survival", it cannot be regarded as a "creative novelty". For as such it would be "not explicable on biological principles and not describable by biological laws" (p. 115). He then concludes that "there is not and cannot be . . . a consistent conjunction of the two principles of continuity and creative novelty; and the adherence to either compels the denial of the characteristic theses of the other" (p. 118), so that in the end "to assert the efficacy of intelligence, Dewey

had to relate it to the other biological functions . . . but to establish its emergent character, he had to surrender his earlier belief that intelligence was *solely* a biological function (which is the Darwinian thesis)" (p. 124).

Now I venture to think that what this criticism really proves is not that Dewey is inconsistent, but that Dr. Feldman has never understood Darwinism. Else he would not argue that it is unable to admit the occurrence of novelties. It is precisely for this purpose that it provides the category of 'accidental variations', which after they have appeared can exhibit positive or negative survival-value and are sifted by natural selection. Overlooking the logical significance of this category and interpreting natural selection in a purely mechanistic way, Dr. Feldman has fabricated the conflict between Darwinism and creativeness which Dewey rightly treated as illusory. But in itself Darwinism is *not* mechanistic, and moreover the efficacy of intelligence had been deduced from Darwinian principles by James long before Dewey.

However, in the end Dr. Feldman is moved to bestow quite a handsome testimonial upon Dewey. "Conscious planning", he says, "has, perhaps for the first time, taken on metaphysical significance in Dewey's philosophy. Guided by this insight he has not hesitated to repudiate the grandiose world-picture of Absolute Idealism . . . and for the otiose security which absolutism gives humanity, he has substituted insecurity with responsibility" (p. 125). It remains to be added that an Index and a chronological bibliography of Dewey's works would have augmented the value of the book.

F. C. S. SCHILLER.

L'Étude de la Pensée. Par G. DWELSHAUVERS. Paris: Téqui. Pp. 230. 20 fr.

THE first half of M. Dwelshauvers' book examines the methods of thought-psychology. Introspection, especially as purified by the experimental precision of the Würzburg school, holds the chief place. The powerful defence of this evidently owes much to Bergson's plea for the recognition of the unique character of mental life, as well as to Külpe, and there is a faint tendency, following the former, but unusual in a Thomist, to confuse objectification with spatialization. Introspection is admitted to be always of past states, without, I think, sufficient emphasis on the implicit awareness of every conscious fact in process. Other methods are not neglected, but occupy a subordinate place. For example, Watson's method gives better knowledge than the analysis of consciousness, of how lower activities work, but cannot alone reveal the true nature of thought. Mental pathology too, regarded as experiments by nature of a kind impossible to us, is of high value, whilst not superseding study of the normal: and objective methods generally, in particular comparative psychology, extend the field of our knowledge of mental states to regions where direct knowledge is not available, but can be analogically applied through the medium of visible products of consciousness.

The second half is devoted to thought itself, and shows throughout, by its continued recurrence to the dominance of structures, the strong influence of the Gestalt school. Thought is distinguished from the image-motor structure of instinctive life by its capacity to set up structures of relations. Such an ambiguous term should be used more carefully. If

relations between things are meant, we come to Green and idealism. If relations between mental facts as mental, to Associationism. But if relations between mental facts as objects, *i.e.*, meanings, are concerned, then meaning is paramount for thought, not relations: Köhler's apes perceived relations, but they were relations of concrete facts, not of meanings. M. Dwelshauvers' attack on Associationism, though justified, is also carried too far: it is not *invariably* true that we understand the lower by the higher, for the converse method is sometimes useful.

M. Dwelshauvers shortly recounts the Peillaube-Romeyer controversy on the intuition of the spiritual—does thought ever directly attain its own essence? A long series of experiments carried out by the author has failed to reveal any trace of such an intuition. This will not surprise most people, who will doubt the existence in thought of any operation other than the becoming diaphanous to mind of some object. On the same topic it is hardly true to say (p. 145) that we first know our thinking act, and the self only by reasoning from it. Knowledge of the act is knowledge, if only implicit, of the self: if not, the Thomist theory of the self is utterly unfounded. It is a pity M. Dwelshauvers has not examined the psychological basis of Picard's theory of knowledge. Picard does not quite rely on the intuition of the spiritual, but on the vague intellectual experience of an existent.

The study on "implicit" thought, which follows, is very interesting. The author's researches show the presence of interior significance in the mind, often divorced entirely from outward expression. But (as admitted on p. 228) these experiments do not yet go far enough, and need additional developments, to be fruitful. For example, nothing has been discovered militating against such a view as Thurstone's (that thought is "incompleteness of expected behaviour"), which is more than foreshadowed in the passages quoted from James. A sketch of the work of Binet, Watt, Messer, and Bühler on the relations of images to thought ends the volume.

The author is sincere and thought-provoking: his chief fault is lack of precision. On this score, he would gain much by reading the English realists, for instance Dr. Broad's "The Mind and Its Place in Nature". There is some deviation also towards idealism, which I hope will not endanger the open realism of his Thomist thought.

JOHN H. MUNKMAN.

Reason: A Philosophical Essay with Historical Illustrations. By THOMAS WHITTAKER. Cambridge University Press, 1934. Pp. 217. 10s. 6d.

In his brief introduction to this volume Mr. Whittaker makes a series of interesting observations upon the relations between rationalistic and empirical method in the sciences and in philosophy (especially in England), on the breadth of Hegel's synoptic logic, and on the resemblances between philosophies that may be antithetic in their general character. He contrives also to introduce teleology, and with it optimism, referring specially to Vico, Hegel, Schopenhauer, and Comte, but remembering always that the predecessors and successors of the neo-Platonists, as well as the neo-Platonists themselves, are especially worthy of attention on the part of anyone who believes that the history of philosophy is the best philosophical text-book.

The chapter which follows and gives its title to the present volume is Mr. Whittaker's encyclopædia article "reason" in Hastings's *Dictionary*.

As we should expect it is learned, orderly, concise and instructive. The subsequent chapters, according to the sub-title of the book, are to be regarded as further historical illustrations of this historical essay. They treat of Comte and Mill, Schopenhauer, Vico, and Spinoza, respectively; but they are illustrations of the second chapter by afterthought only, since each of them was originally constructed to ride upon its own keel. The chapter on Comte and Mill was once a short monograph in a well-known series published by Messrs. Constable early in the present century, and so was the chapter on Schopenhauer. The longest chapter of all, that on Vico, formed three articles in *MIND*, and had special reference (ten years after publication) to Dr. Nicolini's edition of *La Scienza Nuova*. The chapter on Spinoza also appeared as an article in *MIND*. Its title is "Transcendence in Spinoza", but a great part of its interest consists in its references to Averroism, Maimonides, the Neo-Platonists and Bruno, that is to say to the general perspective of Spinozism in the history of thought.

Personally, I found the chapter on Schopenhauer the most interesting, indeed quite fascinating, but it is possible that more is to be learned from the very accurate comparison between Comte and Mill in the third essay; and the author's zeal for comparison and flair for historical analogies on central issues is seen at its best in the short essay on Spinoza. The essay on Vico is rather more discursive, and perhaps not quite so careful. For example, Mr. Whittaker cannot have been as vigilant as usual when he accepts the view that it was *remarkable* for Vico to express "an anticipation of Kant's doctrine that we *make* mathematical truth". Hobbes, for example, said the same thing about geometry, *e.g.*, in the Epistle Dedicatory to his *Six Lessons*. "Geometry therefore is demonstrable, for the lines and figures from which we reason are drawn and described by ourselves; and civil philosophy is demonstrable because we make the commonwealth ourselves". The reason alleged may not have been very convincing, but neither the reason itself, nor this application (I suggest), was at all novel in Vico's day. If Mr. Whittaker's account of Vico's principle "man himself makes history, and therefore he can think it and know it" is accurate, I should say that the obvious mistake in the conclusion cast doubt upon the legitimacy of the principle in any application, and that Hobbes might have perceived the fact if he had asked himself why he did *not* apply the principle to history. But Mr. Whittaker's historical parallels and observations are in general so very apt and so amazingly copious that a reader of ordinary powers and memory experiences a shock of pleased surprise when any such minor question arises. It is not to be expected, of course, that any reader will accept all Mr. Whittaker's wider comments; but he should respect nearly all of them.

JOHN LAIRD.

History and the Self. By HILDA D. OAKELEY, M.A., D.Litt. London: Williams & Norgate, 1934. Pp. 286. 10s. 6d.

THIS book contains discussions of a number of topics related mainly to the theory of history. It begins with the distinction between the private experience of individual selves, which is stated to be history in the primary sense of the word, and the public record of events, which is called "objective" or "categorical" history. This is stated to be history only in a

"secondary" sense of the word; but the historian is nevertheless confined to it and precluded from the former by the fact that the self as subject can never be made the object of knowledge. The further question is raised, whether the course of history can be held to be determined wholly by the creative activity of individuals, and it is concluded that this is not possible, but that part of what happens must be ascribed to "the agency of another factor, which we may here (without strict accuracy) call force, wholly indifferent to good and evil . . ." (p. 38). (I am not clear whether this distinction is intended to coincide with the distinction between "primary" and "objective" history. If it does not, presumably the historian can study the causation of historical events by the creative activity of individuals; but I do not see how this consequence is to be reconciled with the doctrine that the self is unknowable. If it does, the consequence follows that historical events are only intelligible to the historian in so far as they are the product of the factor denominated "force".) A chapter is devoted to the consideration of those factors which seem to threaten the claim of history to be a science (such as the fragmentary nature of historical records, and the inevitable relativity of the historian's standard of judgment to the age in which he lives); and others of the main topics discussed are the relations of History and Ethics, and History and the future. The general attitude taken to these topics may perhaps be conveyed by saying that the author is a disciple of the British Idealist school, considerably influenced by the work of German philosophers, such as Dilthey, Rickert, Troeltsch, upon problems of history and the "Kultur-" or "Geisteswissenschaften".

It is not an easy book to read, because it is wanting in lucidity both of thought and expression. The writing is interspersed with passages of elevated diction; but it would have been better if the author had dedicated her literary resources to the task of being clear. She falls, in fact, into the opposite error to that of those who hold that literary merit is valuable only for the evocation of emotion, and that technical jargon is the proper vehicle for the communication of truth. The sensible view surely is, that the finest prose is not too fine an instrument for the adequate expression of philosophical truth, but that good prose is not necessarily rhetorical.

Nor is it an easy book to review. There are sections of it in which important issues are raised, and in which Dr. Oakeley seems to me to be on the side of truth (for instance, in some things which are said about the relation of History and Ethics). But there is hardly any explicit statement, either of the problem proposed to be solved by the work as a whole, or of the conclusions to be drawn from the various arguments assembled. This is not to say that the various parts of the work have no coherence with one another. But there are different kinds of coherence; there are, for instance, that which belongs to different expressions of the same sentiment, and that logical connection which is proper to different consequences of the same premise. It may be that neither of these is sufficient by itself to constitute the consequence appropriate to a philosophical work. But certainly the former by itself is not; and this work is almost disqualified from being made the object of a philosophical criticism by its deficiency of logic and consequent failure to make explicit either the connections by which its parts are related or the conclusions to which they are relevant.

M. B. FOSTER.

Conation and Our Conscious Life: Prolegomena to a Doctrine of Urge Psychology. By HELGE LUNDHOLM. Duke University Press. Durham, N.C. 1934. Pp. 95. (Duke University Psychological Monographs, No. 3.)

PROF. LUNDHOLM'S treatise is a notable attempt to describe systematically the fundamental features of mental action (to give what he calls a metapsychology) on the lines of hormic psychology. He is an ardent but independent disciple of Mr. McDougall, a dualist like his exemplar, and even prepared to hold that the mind of us is part of a great mental continuum, just as the physical part of us is part of the physical continuum. Conation he defines as purposive or goal-seeking activity, and it is by nature a conscious process, in so far as even on the lowest level of animal life adaptation is guided as if by insight. He sets himself to face the two problems, how conation can have meaning, and yet not be determined by perception (and on p. 51 he maintains valiantly, and surely well, that we do not act because we perceive but perceive in acting); and secondly, how bodily and mental action can be guided by experience. For these two purposes he postulates two impulses, one of curiosity which alternates with that of sleep, and the other an impulse of 'deference' which gives us our experience of reality and is the basis of belief. The impulse of curiosity is excited along with the special reactions induced by the data (in the first instance physical ones) to which the mind-body reacts. These special reactions (which are thus not differentiations of curiosity), or secondary impulses, are traced through three stages: the first a hypothetical one of mere response to contact with an excitant; the second that of specific response, of which the mental side is sensation; the third that of instinctive action proper, containing the three elements of meaning, emotion and motion. Even in the simplest form of response, that of the hypothetical stage, the object is felt as supplying a need, and there is a vague relation of subject to an object separated from it in space. The details of the exposition of the three stages are well worth following, but the value of the book lies not so much in the correctness or the convincingness of these, as in the attempt itself, with its resolute and single-minded eye upon the conative character of all mental states, as shown for instance in the refusal to admit anoetic sentience. There is, it may well be thought, some inconvenience in taking features of our experience—that we do have objects (ideas, Berkeley would say) and believe in the reality of them—and turning these facts into impulses of curiosity and deference, which hardly seem to be impulses in the same sense as pugnacity or commonplace curiosity. And there is some degree of vagueness, and even obscurity, in the working out of the theme. But a welcome is due to an original piece of work, the promised later instalments of which will be awaited with interest.

S. A.

Studies in the Philosophy of Creation with especial Reference to Bergson and Whitehead. By NEWTON P. STALLKNECHT. Princeton University Press, 1934. Pp. xiv, 170. 9s.

ACCORDING to this author, the *notion* of creation, that is to say the vaguish impulse to an adventure of its idea, is connatural with philosophizing man, and "the nature of creation lies near at hand, and is easily contemplated". This last claim, I think, exaggerates the ease of any solution

that can be described, for example, in such a phrase as "the passage of loose-knit abstraction into close-knit actuality." Yet if the author believes that the solution itself is easy, he does not so much as suggest that the journey towards it is other than difficult, and he attempts a hard historical route in which (after a longish preamble) he finds the "genuine logic of creation" grasped most effectively by Ravaisson, proceeds via a prolonged critical examination of Bergson, and approaches his goal through the study of Alexander, Croce, Gentile, Whitehead, Hocking and Royce. During the journey his principal care is to discard the irrational parts of many modern attempts to set forth a philosophy of radical change, spontaneity, contingency, indeterminism, genuine novelty, etc., and to cling to the intelligible thesis that there may be a growth (that is not mere rearrangement) from a structural permanence that allows change to have a meaning.

It is the growth of a poem, however, rather than the growth of a tree that strikes Mr. Stallknecht as something metaphysically illuminating. Indeed, *à propos* of Gentile, he is inclined to suppose that creation must always be in some sort mental, and, *à propos* of Whitehead, that the Platonism of the *Timæus* is the *logos spermatikos* of defensible modern creationism. Mr. Stallknecht himself suggests that some kind of super-Whiteheadedness (with "super-possibilities") should be combined with a Bergsonian metaphysic of *homo poeta* (not of *homo mysticus*); and that the mentalistic rôle of memory regarded as the meeting-point of the structural accumulation of energy in such a way that adventurous growth instead of the mere release of energy may occur, is central in any tenable philosophy of this order.

It is improbable (I think) that those who find the analysis of "creation" quite desperately perplexing are likely to find their more serious misgivings effectively removed by Mr. Stallknecht's argument. His method (I opine) is to guide his readers, through criticism, to a place from which they ought to be able to see, and then metaphorically to shrug his shoulders if any reader still confesses that his eyes are holden. Everyone should admit, however, that Mr. Stallknecht, whether or not he is able to satisfy, has done a considerable general service to current philosophical debate by the pains and persistency with which he has developed his "notion" of creation, and by much that is admirable in the incidentals of his exposition.

JOHN LAIRD.

Die Wissenschaft und die Tat. By H. GOMPERZ. Vienna: Gerold & Co., 1934. Pp. 47. M. 1.50.

THIS vigorously and attractively written pamphlet was an address delivered to the Vienna Philosophical Society in January, 1934. It begins by laying down three conceivable relations of science to action. First, science may be conceived as serving the ends of action, as *ancilla politicae*. As a hand-maid, however, science has a stubborn will of her own, though it must be admitted that every science is generated by a purposive interest. Secondly, science is often conceived as pure pursuit of truth for its own sake. For this view the world is a mass of riddles and the scientist's delight is in solving them. The third view takes science as a presupposition of action. For (with the possible exception of theology) all the sciences are applicable

to life. The sciences however are infinitely progressive, and never arrive at finality. This would seem to create a difficulty, for action has to take as sufficient and final for the time being the knowledge it acts on. But, as Prof. Gomperz very clearly points out, whether our action is guided by knowledge or not it is a *decision*, and takes a risk; moreover the agent cannot wait till science has arrived at final truth. Also to refrain from action, because we are not absolutely certain, is a decision like any other, and no less involves responsibility. Lastly, actual science is never in fact pure science (p. 30). The pursuit of science is an activity like any other, and as such may go wrong, and must take risks. The scientist has to choose his 'truth' among probabilities, and what is "practically certain" is not so absolutely. Nor is inductive generalization a valid inference; it is "the transition from knowing to doing" (p. 43).

It will probably be evident even from this brief summary of Prof. Gomperz's lucid and incisive argumentation, that all of it is the most excellent pragmatism; it may be recommended to all who are muddled about the relations between 'theory' and 'practice'. It shows also that the Austrians at any rate have now clearly grasped what pragmatism is driving at. It is true that some of them have studied also the logistics of Whitehead and Russell, and have generated the interesting hybrid called logical positivism; but Prof. Gomperz mercifully does not think it necessary to veil his meaning in 'baleful signs'. I have nothing to add to his admirable exposition of the emptiness of the ideal of 'pure' science, save that he might have pointed out that its very statement betrays its dependence on human interests. For he himself mentions the *delight* the pure scientist takes in solving riddles (p. 11). Is not this in the first place to assimilate his idiosyncrasy to that of the devotees of cross-word and jigsaw puzzles, and, secondly, to imply that all alike are seeking to gratify their idiosyncrasies?

F. C. S. SCHILLER.

Der Theoretische Weg Bradley's. By ADRIEN CHAPPUIS. Paris: Firmin-Didot & Cie, n.d. Pp. 138. 12 fr.

No thinker has exercised a greater influence upon two generations of English philosophy than Bradley. But, while the activity he has engendered is enormous, it has been left to foreigners to write monographs about him. Several such have appeared of late.

M. Chappuis' little book is a useful introduction for the German reader. The author's principal task is to show how Bradley's metaphysical system follows from a few fundamental principles the rejection of which would overthrow all rationality. He is, I think, successful in showing that if, in pursuit of 'satisfaction', we set out with Bradley, we shall probably accompany him to 't' Absolute. The only critical question M. Chappuis considers at length is whether (or, rather, in what sense) this philosophy "kommt im Grunde vollständigem Skeptizismus gleich". His analysis is interesting, and makes it clear that Bradley was aware of the limitations of his method, and the "one-sidedness" of his solution: in my (perhaps prejudiced) judgment, however, it does not amount to a vindication. No sensible person can expect philosophy to eliminate mystery, but are we not justly disappointed when, in the expectation that he has something clearer and more 'satisfying' to disclose, we allow Bradley to confound

every kind of 'appearance', only to find that he leaves us before a closed door, on which is inscribed '*Somehow*'?

Since it falls outside M. Chappius' plan we have no right to complain that Bradley's crucial positions are not critically examined. His view of judgment, of relations and of relational thought, is not essential to his rationalistic method, but contains, nevertheless, the key to his conclusions. Hence it would seem that a more critical account of these matters (especially of relations) is required even for a fully satisfactory *exposition* of his philosophy. Within its limits, however, and for its purpose, this little work is admirable.

R. E. STEDMAN.

The Revolt against Mechanism. By L. P. JACKS. (Hibbert Lectures, 1933.) George Allen & Unwin, Ltd., London, 1934. Pp. 77. 2s. 6d.

It is an old and apparently incorrigible vice of the human race to interpret scientific methods metaphysically, and to be proportionately dismayed when such an interpretation breaks down. At present something of this sort is happening, rather conspicuously, in physics, and giving preachers a fine opportunity of preaching at the scientists, often without giving them credit for themselves discovering the defects of their methodological assumptions by the working of scientific methods itself and by the profusion of new facts which extend the bounds of knowledge. Dr. Jacks, of course, is much too wise to crow offensively over the scientists on the dungheap called 'spiritual'; but he is perhaps a little too easily satisfied to adopt a Bergsonian interpretation of the function of mechanism, according to which we become merely ridiculous if we fail to subordinate mechanism to our creative purposes, and to look for the seat of religion in the unpredictable. But surely the slavish fear of mechanism is most simply dissipated by observing that (as its etymology shows) it is merely a *device* for calculating events, and that, so soon as it fails to serve this purpose, it may be scrapped without a scruple. The philosopher should wish the scientist more power to his elbow, precisely because he needs more elbow-room to achieve purposes dear to his heart. For the rest it hardly needs saying that, as always, Dr. Jack's two lectures abound in lucid expositions and happy phrasings.

F. C. S. SCHILLER.

Aristotle. By WERNER JAEGER. Translated by RICHARD ROBINSON. Oxford University Press, 1934. Pp. vi + 410. 18s.

PROF. JAEGER'S book is of such importance in the development of Aristotelian studies that an English translation was well worth while. The present translation is made from the original German edition, which has, however, been revised for this purpose by the author. The book was fully reviewed in MIND on its first appearance. So all that needs to be said here is that when re-read in its English form eleven years later it stands the test of time very well. It is not merely that it opened up a new and fruitful line of research. Its positive results in general still hold, though on some points the discussion has been carried further by the work of Dr. Ross on the *Metaphysics* and Prof. Stocks on the *Politics*. The

translation is excellent, and reads like a well-written English work. It might be possible to find a few small points to comment on here and there. I do not, for instance, like the look of "Nus": surely "Nous" has by now become almost naturalised in the English language. But these are trivialities. As a whole, Prof. Robinson's work is a great service to English scholarship.

G. C. F.

Goethe's Stellung zur Unsterblichkeitsfrage. By HEINRICH SCHOLZ. J. C. B. Mohr, Tübingen, 1934. Pp. 48. M. 1.50.

LIKE most normal persons Goethe seems to have varied considerably in his attitude towards the question of immortality. In general he does not seem to have bestowed much thought upon a matter to which access was barred by the unpleasant prospect of death: but when he did think about it he inclined to reserve immortality for the loftier spirits and to doubt that of Tom, Dick, and Harry. This has always been known, and is eloquently put in the second part of *Faust*. To these pronouncements Prof. Scholz has only been able to add the reports of conversations (with Kestner, Falk and Eckermann) according to which he was, under pressure, inclined to appeal to a (more or less) Leibnizian monadology, and to an aversion from the 'waste' involved in extinction. All of which is set forth by Prof. Scholz carefully, but a little pedantically, in a collection of what purport to be popular lectures.

F. C. S. SCHILLER.

La Sensation, Étude de sa genèse et de son rôle dans la connaissance. By PIERRE SALZI. Paris: Félix Alcan, 1934. Pp. 198. 25 fr.

THIS work, which is very obviously an academic thesis in psychology by a *professeur de Lycée*, sets itself to show empirically that sensations are much less rigid and perceptions much more consciously malleable than is commonly assumed. To prove his point, Prof. Salzi relies largely on the clinical observations of an American oculist, Bates, who produced remarkable improvements in cases of myopia, astigmatism and even nystagmus, by training his patients to use their imagination in seeing. It is, of course, quite possible that mechanistic prepossessions about the inefficacy of consciousness should have led to considerable malobservation of the facts; nevertheless, they must be of a sort such that the evidence which Prof. Salzi adduces could be greatly multiplied. This would be highly desirable and he could fairly be expected to do so. Also he should not leave the efficacy of consciousness as a vague and abstract principle, but should endeavour to study it in detail and to develop a more precise theory of how it operates.

F. C. S. SCHILLER.

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VIII.—PHILOSOPHICAL PERIODICALS.

THE JOURNAL OF PHILOSOPHY. xxxi., 20. **M. Ten Hoor.** 'Thought as Awareness and Thought as Behaviour.' [Without attempting to describe 'thought', or 'idea', or 'concept' psychologically, the author accepts "the general contention of the behaviourist that thinking is sub-vocal speech", but insists that "the thinker himself has positive awareness of subvocal behaviour", and proceeds to "an analysis of thought on the basis of these assumptions". His 'analysis' is vitiated by his discussing only abstract 'propositions', and never considering any fully concrete judgment.] **P. B. Rice.** 'On the Nature of Reference.' [Discusses the relations of the 'object', the 'sign', and the 'interpretation', and the difficulty of a transcendent reference, when "reference is defined as the relation between a psychological and an external context". The logical positivists, Dewey, C. I. Lewis, Ogden and Richards, Santayana, and Lovejoy are criticized, and declared to be unable to extricate themselves from the Kantian thing-in-itself. The author finally acquiesces in an 'intent' which "postulates a transcendence"; but it does not occur to him to distinguish between true and false reference.] xxxi., 21. **A. Edel.** 'Monism and Pluralism.' [Asks "exactly what is the difference between monism and pluralism?" and reaches the conclusion that neither absolute monism nor absolute pluralism are ever carried through completely, but that in scientific method some things are always taken as known and others are assumed in the context of the particular inquiry, while some things are always relevant and others irrelevant. Hence "the World as such is no determinate subject of discourse". This amounts to a verdict in favour of "relative pluralism".] **J. Somerville.** 'The Strange Case of Modern Psychology.' [Points out that Locke's question about 'the certainty and extent of human knowledge' has never yet been answered by any psychology, and that the appeal to physiology, in the hope of making psychology a 'science', merely changed the subject.] xxxi., 22. **E. Nagel.** 'The Eighth International Congress of Philosophy.' [Report on the Prague Congress, which the author does not think "reached the standards set by the two preceding ones."] **S. N. Thompson.** 'Formal and Material Thought.' ["In one sense all thinking is formal and *a priori*. It is a process of discovering the consequences of what, for the process itself, may be called a set of postulates. Whether these 'postulates' are true or false, whether they are believed to be true or false, whether they are relevant or irrelevant to any practical need, all of these are questions which have nothing to do with the consequences of the 'postulates'. But in another sense all thinking is material and empirical, for thinking is always the act of an individual mind with interests and wants, likes and dislikes. Thinking does not take place in a psychological vacuum."] xxxi., 23. **W. H. Sheldon.** 'Scepticism.' [Admitting that "the argument for scepticism is far stronger than ever it was", and that "from the point of view of reason or contemplation" it is irrefutable, the author urges that

certainly can be based on action and on values. "To act is to believe in that with reference to which we act", and "there is a certainty native to the experience of value". "Reality is a value, and being a value is not open to doubt." Finally the mystical experience is offered as a case of absolute certainty. Only those who "refuse to act in any way" can avoid this proof.] **A. Ushenko.** 'The Date of a Temporal Perspective.' [Discusses a paper by E. B. McGilvary on 'Perceptual and Memory Perspectives' in xxx., 12.]

REVUE DE MÉTAPHYSIQUE ET DE MORALE. 41^e Année, No. 1. January, 1934. **B. Croce.** *La "Mort de l'Art" dans le système hégélien.* [A vigorous reply to a criticism of Croce's account of Hegel's theory of Fine Art, put forward by Bosanquet in a paper on "Croce's Aesthetics", read before the British Academy (*Proceedings*, vol. ix., 1914). The point at issue is whether Hegel thought, and taught, that Art logically must come to an end, and in fact has come to an end, by passing over into Philosophy. Bosanquet held that the "moments" in the Hegelian dialectic are not successive in time, and that the lower do not vanish in principle on the advent of the higher; that Art, therefore, even though a dialectical stage on the road to Philosophy, has not ceased to exist, and, in fact, continues to exist alongside of Philosophy. Croce quotes at length from the text of Hegel's writings (introducing, incidentally, some plausible emendations for errors due to faulty transcription of lecture notes) to prove that Hegel meant the "death" of Art quite literally. He argues, also, that Hegel has been so understood by the majority of commentators and critics, and that he must be so understood consistently with the logic of his system. He accuses Bosanquet of insufficient meditation on the philosophy of Hegel, of poor knowledge of the relevant literature, and of showing deficient respect for the memory of a great thinker by trying to save him from the paradoxical consequences of his theory. Incidentally, Croce expresses his own dissent from Hegel's theory of Art, on the ground that Hegel, instead of treating Art as "sensuous perfection", was guilty of "Baumgartianism of inferior quality" by interpreting it as the embodiment of the "idea" in sensuous form.] **E. Forti.** *La Méthode scientifique en Morale et en Psychologie suivant l'œuvre de Frédéric Rauh.* [Rauh's two chief works were a critical survey of contemporary Psychology of the sentiments, with special reference to the work of Ribot, and a treatise on *L'Expérience morale*. In the former, he insisted that the essence of scientific method does not consist in restricting oneself arbitrarily to a certain set of concepts, e.g., those of mechanical science, nor in attempting a degree of precision of which the subject-matter may not permit, but in "submission to the facts" i.e., in dealing with facts faithfully according to the nature which experience shows them to possess. Thus, he showed that the sentiments cannot be adequately treated from any one-sided standpoint, whether intellectualist, organic, or voluntarist. They are facts *sui generis* and, whatever light may be thrown on them from these different points of view, they must still be described in their own terms for what they are. In his book on Moral Experience, he pleaded for an experimental attitude in moral theory, i.e., for applying moral principles in practice and interpreting them in the light of the experience thus gained, instead of confronting reality with abstract demands and impracticable ideals.] **J. Laporte.** *Le libre arbitre et l'attention selon Saint Thomas (suite et fin).* [The long-delayed final instalment of an article the earlier portions of which appeared as long ago as January, 1931, and April, 1932. In these earlier articles, it had been

shown that, for St. Thomas, to be free is to be master of one's own acts ; that this is to be master of one's judgment ; and that this is to be master of one's attention. The present article is devoted to the problem of what is meant by this mastery of one's own attention, and the conditions of its realisation. It is entitled : " the limits of liberty ". It begins by clearing up the antinomy of the two statements, (a) that free will is indivisible, i.e., does not admit of more or less ; and (b) that it is a matter of degree. The solution is that it is absolute *quoad exercitium*, i.e., in use or exercise, but limited *quoad specificationem*, i.e., in respect of the agent's apprehension of the actual situation and its possibilities. It next approaches the problem of human attention by way of discussing what free will means for God, the Angels, the Blessed, the Demons, and the Damned. As regards God, the most interesting point is that there is *not only one* " best possible " world. God necessarily wills himself, i.e., he necessarily wills perfection. His will is fixed on the highest good : God cannot do or will evil. But, there are many alternative ways of realising the highest good, and as between these God can and does choose indifferently. Relatively to any one of them, he is free either to act or not to act. He is not automatically committed to one only as *the* best. " Whatever God does, he can always do better." Compared with man's liberty, God's possesses a superior perfection in that God is not limited *quoad specificationem*, i.e., in the range of objects of his attention. Such limitations appear, in various ways and degrees, in the liberty of the other classes of beings mentioned, the difference between the Angels and the Demons being that the will of the former is fixed on good, that of the latter on evil, but, *servato ordine finis*, the latter have a free choice of evils, just as the former have a range of goods to choose from indifferently. Man's position is different. His will, as such, is " rational desire ", and not " sensuous appetite ". But, he is hampered partly by ignorance, restricting the range of his attention, and partly by the disturbing influences of habit and passion, the latter of which may absorb so much of the limited amount of mental energy available to him, that the will has not enough left over to give the requisite attention to the object of rational desire which would be an effective alternative to the object of passion. Passion, in short, " distracts " the attention. The tyranny of habit and passion is not, however, invincible. Always we can defeat them by directing our attention to other objects. Hence, the first rule is to check oneself from acting and give oneself time to deliberate. In conclusion, the author attempts to show that even modern writers on the will, though they have used different language, have in fact taught a doctrine substantially identical with that of S. Thomas, e.g., William James and Bergson.] **J. Nogué.** *La détermination du fait primitif (suite et fin)*. [The author continues the tortuous path of his analysis of the primitive fact for which, in the previous article, he had accepted Maine de Biran's theory of the Ego as act or movement, but which, rejecting de Biran's description of this movement as effort against an external resistance, he had, with Bergson, characterised as *élan*. We now learn that we must conceive this *élan* as needing, and carrying with it as part of itself, a fulcrum or point of application (*appui*). The primitive fact (the Cartesian Ego) is, then, this immediately experienced, inward movement of which *élan* and *appui* are the two complementary aspects. This movement is directed upon sense-data (*sensibles, qualités, données*), for the distinction of act and data is fundamental. It takes the form of thought (*pensée*), which essentially consists in correlating sensibles as " signs " with other sensibles as " objects ", thus creating a new world of expression (through signs) in

correspondence with the world of objects. Moreover, "existence", first expressed in the proposition, "I think, I am", is not part of the primitive fact as such, but belongs to the proposition which, as expressed, is addressed by the Ego to others, and thus acknowledges both the existence of others transcending thought, and the participation of the Ego in a "world". So far, my summary has been based on the beginning and end of the article. In between, there is a long and obscure section in which the author tries to explain how the primitive act of *élan* and *appui*, in its repeated pulses, using sensible signs to mean objects and their relations, creates "progressions" of signs which mean the temporal and spatial orders. This, so far as I can understand him, is what the author professes to do. To be honest, I must confess that I have not been able to follow the hocus-pocus by which he does it.] **C. Białobrzewski.** *Sur l'interprétation concrète de la mécanique quantique.* [Begins by pointing out that the physical interpretation of the symbols of the mathematical formulæ employed in modern quantum mechanics is not without difficulty, for there is no direct passage from the empirical data, especially readings on instruments, to the theoretical formulæ. The transition can be made only by means of a series of intermediate judgments which leave the immediate data of experience more and more behind them. None the less, the actual success of these formulæ in explaining and predicting empirical phenomena implies that there must be a physical interpretation. The author approaches the task of outlining this interpretation by a brief survey of the essential differences between the classical and the quantum mechanics, pointing out that for the two central questions of the classical theory, viz., (1) What is the numerical value of any factor observable in a given system? and (2) What change will the system undergo in a given interval of time? the new mechanics substitutes these two questions: (1) What are the possible values of a measurable factor, and what is the probability of each of these values? and (2) What are the possible changes of a system and what is the probability of a certain change during a given time? The classical theory takes the course of changes of a system to be determined by its initial state; the quantum theory makes the changes depend on the initial state taken together with all the possible final states. In other words, on the modern view, an atomic system differs from a "mechanism", as conceived by the classical theory, and approaches to the nature of an "organism". Thus, e.g., an atomic system forms a "whole" the constituent elements of which cannot be distinguished from one another and treated as independent after the manner of the classical theory. And the whole behaves in ways, and exhibits characteristics, which could not have been deduced from a study of the constituents taken in isolation from the whole. And even though these greater possibilities of the whole are restricted by the "interdict of Pauli", none the less Weyl's principle holds that the "whole is greater than the sum of its parts". A chemical atom is more than merely the sum, or the arrangement, of its constituent protons and electrons. In this, the "organic" character of modern physical theory appears most clearly. The article concludes with an interesting attempt to work out a close analogy between the concepts of quantum physics and Aristotle's concepts of "matter" and "form".] **Études Critiques.** **P. Devaux.** *Le pragmatisme conceptuel de Clarence Irving Lewis.* [A careful and competent analysis of C. I. Lewis's *Mind and the World Order* and other writings on the theory of knowledge. Distinguishes his Pragmatism from those of James and Poincaré, and gives special attention to Lewis's distinction of the *a priori* and empirical elements in knowledge.]—**Questions Pratiques.**

R. Aron. *L'objection de conscience.* [An article on the position of the conscientious objector to military service. Puts two questions: (1) Can the objector justify his revolt against society? (2) Under what conditions, if at all, can society accept his revolt? The possibility of war can, under present political conditions, not be eliminated from the lives of States, and the citizen of a State cannot demand to choose between obeying some laws and disobeying others, or to limit his duties as citizen to suit his private standards. Yet, to persecute conscientious objectors who refuse military service as incompatible with the law of Christ, is repugnant to our feelings. The author suggests that if such objectors were compelled to undertake prolonged "civil service", *e.g.*, in labour-camps, in place of the "military service" for which their fellow-citizens are compulsorily conscripted, their consciences would be salved, the State would benefit, and the number of objectors would not be likely to be very large.] New books, French and Foreign. Periodicals. Obituary: Paul Painlevé; Émile Meyerson.

41^e Année, No. 2. April, 1934. **E. Meyerson.** *Philosophie de la Nature et Philosophie de l'Intellect.* [A defence, by Meyerson, of the fundamental point of view underlying all his philosophical writings on the methodology of the Sciences. He insists on the distinction between Philosophy of Nature and Philosophy of the Intellect, treating the former as a branch of Metaphysics, the latter as a theory of the methods which thought employs in its efforts to apprehend the real. The latter must further be distinguished from Psychology on the one side and from Logic on the other. Meyerson's main doctrines are that the intellect seeks to understand by discovering identity (*l'identique*); that reality, as presented to us in experience, to a large extent conforms to this demand for identity; but that there is also a surd, irrational element which defeats the intellect. These propositions are discussed and rediscussed from various angles, partly by way of reply to criticisms, *e.g.*, by Lalande and Schlich, of Meyerson's theories, partly by reference to the attitude of Science towards laws which, like that of Carnot, do not assert the existence, or the maintenance in change, of identities in Nature. Meyerson claims that his analysis explains the part played in knowledge by Leibniz's *Intellectus ipse* and by Kant's *a priori*.]

H. Kelson. *La méthode et la notion fondamentale de la théorie pure de droit.* [An interesting article written from a strictly positivist standpoint. Modern jurisprudence is all too often a hybrid of ethics, theology, psychology, biology, etc., instead of the "pure" science studying the essence of "Right" (= *Recht*, in the sense of established rule of law) which it ought to be. Human actions are not merely physical events in time and space, subject to the law of causality: they also have a meaning in a social context, *e.g.*, they may be crimes or offences. The predication of such a character implies the application of a "norm", which must be distinguished alike from the act by which it is set up and the act by which it is apprehended. The science of Right is the science of these norms, *as such*; it differs from "juridical sociology" which studies, not these norms as such, but, *e.g.*, the reasons why certain norms are established in certain societies, or the effects of their application. So, again, it differs from ethics, which is concerned with absolute values, like justice and equity. It is not part of the pure theory of Right to discuss whether a given rule of law, does, or does not, conform to absolute justice. In fact, absolute justice though a necessary concept, is indefinable: it is an "a-rational ideal", and thus beyond the scope of science which is reason applied to facts of experience. All arguments viewing a given order of law in the light of

absolute justice (all "natural right" doctrines in jurisprudence are of this type) are "ideological", and really serve the interests, not of knowledge and truth, but of will and feeling, being attempts either to justify the existing order as conforming to the ideal, or to condemn it as being in conflict with the ideal. Considered in a purely positivistic spirit, the essence of Right or Law is a hypothetical proposition, attaching to a given action a certain consequence (sanction or punishment). It is a norm which establishes a constraint. An offence, an illicit act, thus, does not "break the law": it is rather the occasion for the law to come effectively into play. This is the "primary form of the juridical norm". It follows from its being hypothetical, that Right is a means, not an end. It is the social technique of an order of constraint, devised for the purpose of maintaining a certain type of social organisation. It is thus always historically conditioned.] **J. Rouge.** *Le culte du "moi" et la culture du "moi" chez Frédéric Schlegel.* [Directed against the one-sided picture of Schlegel which is based on his most extreme and provocative aphorisms and which is summed up in Ueberweg's epigram (in his *History of Philosophy*), that "Schlegel has substituted the Genius for the Pure Ego of Fichte." The author points out that Schlegel was much more under the influence of Schelling than of Fichte; and that, if one takes into account the whole of his philosophy, as well as the undeniable influences on his thought of his Christian upbringing, his classical learning, and of the lessons of his own experiences, as all these are reflected in his writings, one gets a very different and very much more balanced picture of his thought as a whole—a thought in which each one-sided extravagance is supplied by the thinker himself with its proper complement and corrective. Thus, *e.g.*, even in *Lucinde* (which M. Rouge characterises as a "rotten novel and a vile action"—"vile", because of the merciless exposure of Schlegel's relations with the lady who had left her husband to live publicly with him as his mistress), the "immoralist" passages of purely selfish indulgence are balanced by those describing how the lover, on becoming aware that he may expect a child from his mistress, awakens to an appreciation of the joys and responsibilities of paternity and the dignity and beauty of domestic life: "if you want to have a complete vision of humanity, seek a family; the family is the organic unity of minds, and therefore it is all poetry", writes Schlegel. So, again, if he emphasises "self-determination", he insists also that it implies "self-limitation". And the "individualistic" ideal of being oneself and living one's own life according to one's own desires, is balanced by the ideal of "universalisation", of sympathetic identification (*Einfuehlung*) with all manifestations of the Infinite: "in order to know truly, you must love what you would know".] **L. Leprince-Ringuet.** *Les constituents de la matière.* [A survey of the parts assigned in recent physical theory to the various ultimate constituents of matter, *viz.*, the proton, the negative electron, the positron (positive electron), the neutron, the deuteron, the alpha particle, in the context of Einstein's equation, $W = mc^2$, which expresses the relation of the mass of a body at rest to radiant energy, and provides for the "dematerialisation" of the body by the transformation of part, or whole, of its mass into radiant energy, and, *vice versa*, the "materialisation" of a mass at rest out of radiant energy.] *Études Critiques.* **A. Rivaud.** *Documents inédits sur la vie de Spinoza.* [Discusses the new light thrown on Spinoza's youth by documents recently published by Vaz Dias and Van der Tak, which show that he was the eldest son of a rich merchant, and that he administered for two years, after his father's death, the complicated business which he and his brothers in-

herited, until the troubles into which he was getting with the Jewish authorities through his unconventional and revolutionary ideas, made it desirable to withdraw from active business and agree to the appointment of a trustee. His conduct on that occasion suggests a shrewd and calculating character who, after his expulsion from the Jewish community (which was a civil, not a religious, condemnation), knew how to combine inward freedom of thought with an outwardly unaggressive attitude towards external authority and convention.] Questions Pratiques. **M. Lazard.** *Le gouvernement des démocraties modernes.* [A genuinely "critical" review of B. Labergne's book under the same title. The reviewer concentrates on the practical proposals of the author for increasing the efficiency of democratic government in modern societies, and especially in France, and develops in sixteen points the reasons why he cannot accept M. Laverigne's proposals as adequate.] New books, French and Foreign. Periodicals.

REVUE NÉO-SCOLASTIQUE DE PHILOSOPHIE. Tome 37. Deuxième Série, No. 44. Nov., 1934. **A. Forest.** *Thomisme et idéalisme.* [Thomism and idealism have much in common. "Philosophy does not cease to be the *science de l'être* in becoming idealist." The inspiration of idealism comes from a conviction of the reality of the free activity of intelligence, which leads to the denial that there can be a fully and completely constituted "objective reality" that thought merely copies; thought which does not contribute to the *making* of things is not genuine thought. Thomism seems at first to be the negation of this conception, since it begins by the assertion of the objective existence of the *cognitum*; it might seem that idealism is a philosophy of *intellectio*, but Thomism of the *intellectum*. But the true point of difference between the two is rather that idealism—it is specifically the doctrine of contemporary French idealists which is meant—treats as characteristic of thought what is true only of human thought, *viz.*, that it is not intuitive, and so cannot bestow existence upon its object. The fundamental conception of Thomism is that "knowledge is a sort of second creation of things in thought" and one which may almost be said to have a higher dignity than their first creation. Things in *propria essentia* are separate and isolated; thought consists in uniting them and thus leading them up, so to say, to a superior level of existence. It is true that it is the principles of being which explain those of knowledge, but at the same time, nature is no more than "the matter for the act of thought, the affirmation of the true". (I hope I have succeeded in presenting the main contention of the writer, though I find him difficult to follow.)] **L. Noël.** *La notion de philosophie chrétienne.* [In what sense, if any, can there be a specifically Christian philosophy? The contents of a philosophy ought to be a body of connected doctrines resting on rational grounds equally capable of appreciation by the believers in any given religion and by the unbelievers. In this sense neo-scholasticism, like any other philosophical system, must be autonomous; none of its positions must depend on the acceptance of a faith or a theology. As a matter of historical fact, the philosopher may have been led to the raising of a problem, or to the solution he offers of it, by his antecedent religious faith. But in that case, this faith is only related to the resultant philosophy considered as a philosophy, as the fall of the apple in the story is to the *Principia* of Newton. It may be said that dogma, the Church, the Christian life, etc., present us with facts which cannot be studied without a subordination of reason to faith.

But admitting this to be so, the act of subordination marks the transition from philosophy to theology. Philosophy can at most recognize in these facts, as in other facts of life, the presence of something refractory to philosophical explanation, and thus leave open the possibility that there is a solution of the mystery which can be supplied by faith. (Cf. Kant's use of the notion of a "limiting concept".) Philosophy which intends to remain philosophy must not include in its constructions anything that is not equally accessible to believer and "infidel".] **A. Hagen.** *Analogia Entis*. [On the recent work of Pryzwara with this title. H. defends the method of "transcendental deduction" in metaphysics, holding that, owing to his rejection of it, P. is logically bound either to abandon demonstration in metaphysics, or to found his system on a basis of moral "pragmatism".] **A. Dondeyne.** *Autour de quelques livres récents de métaphysique*. [Deals with the latest work of P. Descogs, J. Maritain, R. Garrigou-Lagrange.] **E. De Brayne.** *Bulletin d'esthétique*. **J. Dopp.** *Ouvrages récents d'histoire de la philosophie moderne*. Book Reviews, Chroniques, etc.

ERKENNTNIS. Band iv., Heft 4 (zugleich *Annalen der Philosophie*, Band xii.), 23rd October, 1934. **K. Ajduciewicz.** *Das Weltbild und die Begriffsapparatur*. [Presupposing his article "Sprache und Sinn" in Heft 2, the writer develops a theory of "radical conventionalism"—every branch and stage of critical knowledge consists of a system of abstract meanings which is more or less arbitrary. "The function of sense-data is simply to determine in accordance with the system of meanings adopted what elements in the system shall enter into the world-picture."] **G. Mannoury.** *Die signifikanten Grundlagen der Mathematik, I*. [Exposition of "significs" (the term is taken from Lady Welby) as the systematic analysis of the psychological content and affiliations of linguistic acts.] Report of International Congress of Philosophy held at Prague in September last.

Heft 5, 27th November, 1934. **P. Frank.** *Hans Hahn*. Obituary notice. Hahn, who died July, 1934, is here declared to be the virtual founder of the Wiener Kreis. **G. Mannoury.** *Die signifikanten Grundlagen der Mathematik, II*. [The language of mathematics has not freed itself from subjective elements; and the belief in mathematics as an objective, independent and accurate system of meanings is a superstition.] **O. Neurath.** *Radikaler Physikalismus und "wirkliche Welt"*. [Maintains against Schlick's and Vogel's articles in Heft 2, the following four propositions. (1) All existential propositions in science are chosen arbitrarily and can be changed. (2) An existential proposition is false when it is not in accord with the total system of science. (3) Existential propositions are tested by comparison with protocol propositions. (4) Radical physicalism includes, as "Scheinsätze," propositions about objects and events that cannot be described.] **F. Bon.** *Der Gegenstand der Psychologie*. [The objects of a science are public, for a science cannot exist without language, and language is pointless unless it has the same meaning for all. (Carnap's view that only the verifiable has meaning is an unfortunate contradiction of fact, unless meaning be dogmatically defined as verifiability.) But psychical objects are private to the individual. Psychology is, however, in fact a science. Therefore its object must be the physical interaction between men and things and men and men.] Reviews.

Heft 6, 17th December, 1934. **M. Schlick.** *Philosophie und Naturwissenschaft*. [A public lecture. Philosophy is not metaphysics, not a system of knowledges, but the elucidation of meanings, and of meaning as

such. All its matter comes from the sciences.] **B. Juhos.** *Kritische Bemerkungen zur Wissenschaftstheorie des Physikalismus*. [Discusses the reaction of Carnap and Neurath against the tenet hitherto prevailing in the Wiener Kreis (and expressed in Wittgenstein) that truth or verification is constituted by reference to simple judgments of sensory givenness. They stigmatise this as involving a residuum of metaphysics and recoil to a pure positivism (Physikalismus) for which the truth of every proposition of science is a function of other propositions. Which raises the difficult question: How, among the several possible systems which are free from internal contradiction is the true system to be distinguished?] Reviews.

KANT-STUDIEN. Band xxxix., Heft 3/4, 1934. **P. Menzer.** *Deutsche Philosophie als Ausdruck deutscher Seele*. [The German mind is most authentically expressed in its music and its idealistic philosophy. The latter should be appreciated by foreigners if they are to understand the Germans in their present plight, and pursued by Germans in the service of the rehabilitation of their people.] **G. Calogero.** *Philosophie der Philosophie im heutigen italienischen Denken*. [With special reference to Gentile and P. Carabellese (disciple of Varisco).] **J. E. Salomaa.** *Die Anfänge des Hegelianismus in Finnland*. [An account in chronological sequence of the earlier Finnish philosophers familiar with or influenced by Hegel; ends with the mention of Snellman and the welcome hint that a special article on him may be forthcoming. It shows firstly that Hegel was read in the early 'twenties, secondly that an independent development of his ideas was not achieved.] **W. Del-Negro.** *Hans Vaihingers philosophisches Werk mit besonderer Berücksichtigung seiner Kantforschung*. [Vaihinger's chief service lay in his Kantian exegesis. His own positivism is now out of fashion, though the austerity underlying it is a paragon of philosophic temper.] Two critical surveys: *Humanismus in der Gegenwart*, by **H. Kuhn**, and *Bericht über Neuerscheinungen der französischen Philosophie*, by **H. Rabow**. Reviews. Appendix: a fifth classified bibliography of recent philosophical articles and books in the chief cultural languages.

IX.—NOTES.

ON A REDUNDANCY IN "PRINCIPIA MATHEMATICA".

THE following definitions, primitive propositions, and theorems are to be found in *Principia Mathematica* :—

| | | |
|-------|--|-----|
| *1.01 | $p \supset q . = . \sim p \vee q$ | Df. |
| *1.2 | $\vdash . p \vee p . \supset . p$ | Pp. |
| *2.2 | $\vdash . p . \supset . p \vee q$ | Th. |
| *2.16 | $\vdash : p \supset q . \supset . \sim q \supset \sim p$ | Th. |
| *2.38 | $\vdash : . q \supset r . \supset : q \vee p . \supset . r \vee p$ | Th. |
| *9.06 | $p . \vee . (\exists x) \phi x : = . (\exists x) . p \vee \phi x$ | Df. |
| *9.1 | $\vdash : \phi x . \supset . (\exists z) \phi z$ | Pp. |
| *9.11 | $\vdash : \phi x \vee \phi y . \supset . (\exists z) \phi z$ | Pp. |
| *9.12 | What is implied by a true premiss is true. Pp. | |

Where "Df", "Pp", and "Th" stand, respectively, for "definition", "primitive proposition", and "theorem".

The proofs of *2.2, *2.16, and *2.38 do not depend upon *9.1. This may be seen either by actually inspecting the proofs, or more easily, from the fact that *9.1 is not introduced until after *2.2, *2.16, and *2.38 are proved.

Primitive proposition *9.1 is redundant within the system of *Principia Mathematica*. I show this as follows by deducing *9.1 from the other propositions in the above list :—

Theorem I. $\vdash . (p \supset q) \supset [(p \vee \phi x) \supset (q \vee (\exists z) \phi z)] .$

Proof :

$$[*2.38] \quad \vdash : (p \supset q) \supset [p \vee \phi x . \supset . q \vee \phi x] . \quad (1)$$

$$[*2.2] \quad \vdash : . \{ (p \supset q) \supset [p \vee \phi x . \supset . q \vee \phi x] \} : \supset : \{ (p \supset q) \supset [p \vee \phi x . \supset . q \vee \phi y] \} \vee \{ (p \supset q) \supset [p \vee \phi x . \supset . q \vee \phi z] \} \quad (2)$$

$$[(1), (2), *9.12] \quad \vdash : \{ (p \supset q) \supset [p \vee \phi x . \supset . q \vee \phi x] \} \vee \{ (p \supset q) \supset [p \vee \phi x . \supset . q \vee \phi y] \} \vee \{ (p \supset q) \supset [p \vee \phi x . \supset . q \vee \phi z] \} \quad (3)$$

$$\left[*9.11, \frac{(p \supset q) \supset [p \vee \phi x . \supset . q \vee \phi z]}{\phi z} \right] \vdash : \{ (p \supset q) \supset [p \vee \phi x \supset q \vee \phi x] \} \vee \{ (p \supset q) \supset [p \vee \phi x \supset q \vee \phi y] \} : \supset : (\exists z) : \{ (p \supset q) \supset [p \vee \phi x . \supset . q \vee \phi z] \} \quad (4)$$

$$[(3), (4), *9.12] \quad \vdash : . (\exists z) : \{ (p \supset q) \supset [p \vee \phi x . \supset . q \vee \phi z] \} . \quad (5)$$

$$[(5), *1.01] \quad \vdash : . (\exists z) : \{ \sim (p \supset q) \vee [p \vee \phi x . \supset . q \vee \phi z] \} . \quad (6)$$

$$[(6), *9.06] \quad \vdash : . \sim (p \supset q) . \vee : (\exists z) [p \vee \phi x . \supset . q \vee \phi z] . \quad (7)$$

$$[(7), *1.01] \quad \vdash : . (p \supset q) \supset \{ (\exists z) [p \vee \phi x . \supset . q \vee \phi z] \} . \quad (8)$$

$$[(8), *1.01] \quad \vdash : . (p \supset q) \supset \{ (\exists z) [\sim (p \vee \phi x) \vee (q \vee \phi z)] \} . \quad (9)$$

$$[(9), *9.06] \quad \vdash : . (p \supset q) \supset \{ \sim (p \vee \phi x) . \vee . (\exists z) (q \vee \phi z) \} . \quad (10)$$

$$[(10), *1.01] \quad \vdash : . (p \supset q) \supset \{ (p \vee \phi x) . \supset . (\exists z) (q \vee \phi z) \} . \quad (11)$$

$$[(11), *9.06] \quad \vdash : . (p \supset q) \supset [(p \vee \phi x) \supset (q \vee (\exists z) \phi z)] . \quad \text{q.e.d.}$$

Theorem II. $\vdash : \phi x . \supset . (\exists z) \phi z$.

Proof :

$$\begin{aligned} & \left[\text{Th. I, } \frac{\sim p}{p}, \frac{\sim q}{q} \right] \vdash : (\sim p \supset \sim q) . \supset : \\ & \quad [(\sim p \vee \phi x) \supset (\sim q \vee (\exists z) \phi z)] \quad (1) \\ & [(1), *1.01] \vdash : (\sim p \supset \sim q) . \supset : [(p \supset \phi x) \supset (q \supset (\exists z) \phi z)] \quad (2) \\ & \left[(2), \frac{\phi x \vee \phi x}{p}, \frac{\phi x}{q} \right] \\ & \vdash : [(\phi x \vee \phi x) \supset \sim \phi x] \supset \{[\phi x \vee \phi x . \supset . \phi x] : \supset : [\phi x \supset (\exists z) \phi z]\} \quad (3) \\ & [*2.2] \vdash : \phi x . \supset . \phi x \vee \phi x \quad (4) \\ & [*2.16] \vdash : [\phi x . \supset . \phi x \vee \phi x] : \supset : [\sim (\phi x \vee \phi x) \supset \sim \phi x] \quad (5) \\ & [(4), (5), *9.12] \vdash : \sim (\phi x \vee \phi x) : \supset . \sim \phi x \quad (6) \\ & [(6), (3), *9.12] \vdash : [\phi x \vee \phi x . \supset . \phi x] : \supset : [\phi x \supset (\exists z) \phi z] \quad (7) \\ & [*1.2] \vdash : \phi x \vee \phi x . \supset . \phi x \quad (8) \\ & [(8), (7), *9.12] \vdash : \phi x . \supset . (\exists z) \phi z \quad \text{q.e.d.} \end{aligned}$$

Our Theorem II is the same as *9.1 of *Principia Mathematica*.

J. C. CHEROWETH MCKINSEY.

PROPOSED JOURNAL OF LOGIC.

An informal meeting of persons interested in the advancement of logical studies, and particularly in the possibility of providing greater facilities for the publication of papers in symbolic or mathematical logic, was held on 27th December, at New York University, during the annual meeting of the Eastern Division of the American Philosophical Association.

Prof. C. J. Ducasse reported that a considerable majority of the logicians and mathematicians who answered a questionnaire recently sent out, were of the opinion that a need existed for an international Journal of Logic which would supplement existing channels for the publication of papers in symbolic or mathematical logic. The sense of the meeting was that an Association should be organized for the advancement of logical studies through the establishment of such a Journal, and possibly also by means of meetings occasionally held in conjunction with those of the A.A.A.S. or the American Philosophical Association; and that a committee of organization be appointed by the chairman. Some forty-eight persons present at the meeting indicated their willingness to join such an Association.

A Committee of Organization, consisting of the following persons, was appointed :—

| | |
|-----------------------------------|----------------------------------|
| C. A. Baylis—Philosophy, Brown. | S. K. Langer—Philosophy, |
| A. Church—Mathematics, Princeton. | Radcliffe. |
| M. R. Cohen—Philosophy, C.C.N.Y. | J. B. Rosser—Mathematics, |
| H. B. Curry—Mathematics, Penn. | Princeton. |
| State. | H. B. Smith—Philosophy, Univ. of |
| C. J. Ducasse—Philosophy, Brown. | Pa. |
| | P. Weiss—Philosophy, Bryn Mawr. |

Since more definite plans for the proposed journal must depend largely on the funds that would be available, all persons (whether or not themselves working in the field of Logic) who would favour the launching of such a Journal, and who would be willing to lend it their support by joining the proposed Association (with dues of probably \$3 a year) are asked to send their names to Prof. C. J. Ducasse, Brown University, Providence, R.I.

**MIND ASSOCIATION: ANNUAL MEETING AND JOINT
SESSION WITH THE ARISTOTELIAN SOCIETY.**

THE ANNUAL MEETING of the Mind Association will be held this year at Bedford College, London, at 5 p.m. on Friday, 5th July.

It will be followed by a JOINT SESSION WITH THE ARISTOTELIAN SOCIETY, for which the following arrangements have been made :—

FRIDAY, 5TH JULY.

At 8 p.m. Chairman : Prof. G. C. Field.

Address by Prof. L. S. Stebbing.

SATURDAY, 6TH JULY.

At 10 a.m. Chairman : Prof. L. S. Stebbing.

“Mechanical and Teleological Causation.”

Mr. C. A. Mace, Prof. G. F. Stout, Dr. A. C. Ewing.

At 8 p.m. Chairman :

“Explanation in History.”

Dr. H. D. Oakeley, Mrs. Cornforth, Prof. M. Ginsberg.

SUNDAY, 7TH JULY.

At 10 a.m. Chairman :

“Internal Relations.”

Mr. G. Ryle, Mr. A. J. Ayer, Prof. G. E. Moore.

At 8 p.m. Chairman :

“Is a Science of Theology Possible.”

Prof. J. L. Stocks, Prof. J. W. Harvey, Prof. J. Laird.

Board and lodging will be provided at Bedford College. The *inclusive charge* for the period from Friday afternoon till Monday morning will be £1. 11s. 6d. But Members of the Conference not boarding at the College may have meals there, for which the charges will be : Lunch, 2s. ; Tea, 9d. ; Dinner or Supper, 3s. 6d. Such Members may obtain tickets for the dinner on Friday evening from the Bursar, Bedford College, N.W. 1, on or before Tuesday, 2nd July ; and for all other meals, at the College on 5th July.

There will be a charge of 10s. as a Registration Fee for Membership of the Conference ; in return for which Members will receive the Supplementary Volume of the Aristotelian Society, containing the papers.

Applications for Membership, and for Board and Lodging at the College, should be accompanied by payment of the Registration Fee, and of the charge for the accommodation required. They should be made to

Prof. L. S. Stebbing,

27 Belsize Park, N.W.3.